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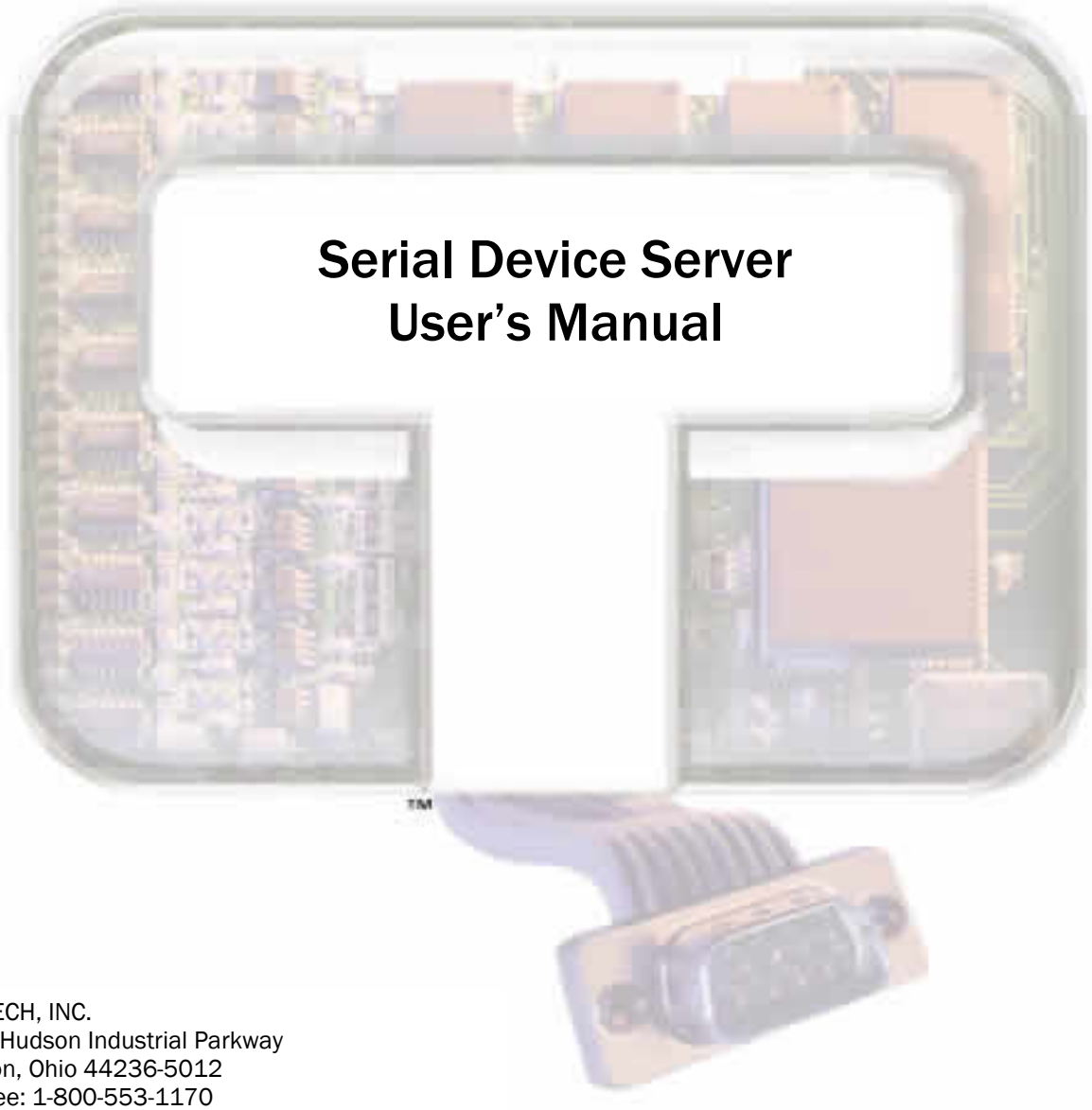
Serial Device Server
User's Manual



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Quatech Device Server
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Changes or modifications to this device not explicitly approved by Quatech will void the user's authority to operate this device.

Feedback

Quatech, Inc. encourages and appreciates feedback concerning this document. Please send any written comments to the Technical Support department at the address listed on the cover page of this manual.

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Introduction

Quatech's line of Serial Device Servers (SDS) is designed to network-enable any device currently using RS-232 or RS-422/485 serial communications protocols. Our Device Servers provide industry-leading hardware and user-friendly software to make connecting your serial devices to an Ethernet network a surprisingly simple process.

There are many reasons to network your serial devices using a Quatech Device Server, such as:

Note: For on-line technical support, see Quatech's Web site.

- Remote support – support personnel can diagnose and repair many problems by communicating with your serial devices via the Internet or Intranet.
- Remote management – install new firmware or software upgrades on your serial devices without physically removing them from service.
- Efficient communications – instead of having one device communicating with one computer, your device can communicate with any computer on the network.
- Wireless freedom – Wi-Fi-enabled Device Servers provide serial-to-wireless connectivity to your network.
- Lower cost of ownership – no need to upgrade serial devices to newer, costlier versions containing built-in Ethernet interfaces – if such an upgrade is even available!
- Extended service life of software – your existing software can be used to communicate with the serial device as if connected to a local COM port; the network connection is "invisible" to the application.

A typical scenario:
You have a serial device that is operated by a PC. The application software on the PC "talks" to the serial device using COM port 3. Unfortunately, anyone who wants to communicate with that device must come to the local PC. This can be very time consuming if the serial device is located in a remote area, and expensive if you need a PC for every serial device.
A Device Server eliminates the need for a local PC and allows anyone with the proper application software, the Quatech Device Server drivers, and authorized access to the network, to communicate with the serial device.

After following the simple steps included in the Quick Start Guide to attach your network and serial devices to the appropriate connectors on the Serial Device Server, you'll need just a few more minutes to install the driver. You'll then be able to communicate with the serial device via its own application software and with the SDS using a Web browser!

To network-enable a serial device, plug it into the serial port located on the Device Server. Plug in the network Ethernet cable and power source, and load the Quatech device drivers onto a host PC anywhere on the network, using the instructions provided. The Quatech device drivers will install the SDS' serial ports as if they were additional local COM ports in Windows. Simply change the settings in the serial device's application software to look for the serial device on the new COM port. It's that easy!

Understanding how virtual communication ports work

Note: Quatech Device Server technology now allows access to individual serial devices by anyone with access to the network on which they are installed.

Single port Device Servers allow you to network individual serial devices such as printers, simple terminals, or medical monitoring equipment that were previously accessible only via a direct link.

According to Dataquest, a Device Server is a "specialized network-based hardware device designed to perform a single or specialized set of functions with client access independent of any operating system or proprietary protocol." In terms of your new SDS, this means that you can connect any serial device to your network by connecting the serial device to a serial port on your SDS and connecting the Ethernet port on your SDS to your network.

Note: Anyone in your organization with a PC can connect to the serial device over the network just as though the two devices were directly connected.

The SDS, once it has been correctly configured, makes accessing a single serial device such as a time clock from your network a transparent operation. This means that a PC can perform all the operations in the same way it would if the serial device were plugged directly into its serial port.

Note: A protocol is a set of rules that notifies a transmitting device and a receiving device that the other is present and ready to exchange information, when the exchange is complete, and whether it was successful.

A network connection allows operation of serial devices at much greater distances than can be accomplished with a direct serial connection. Your SDS uses the TCP/IP protocol suite for network communications. This means that communication through an SDS can actually be more reliable than communication over long serial lines, which lacks the advanced error checking built into TCP/IP.

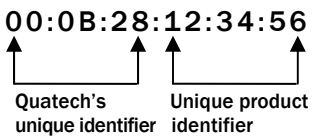
Another benefit of accessing a serial device through an SDS is that you can monitor and manage the device remotely, even from across the world, if you have authorization and the network connection is to the Internet.

Understanding MAC and IP addresses and port numbers

Identifying the Ethernet (MAC) address

Note: You can find the unit's Ethernet (MAC) address on the product information label located on the bottom of the unit.

Ethernet address, hardware address, and MAC address are all equivalent names for a device's unique network address. In the case of an SDS, the first three bytes identify the unit as a Quatech product. The last three bytes are unique to each unit and are assigned when the unit is released from production. Colons separate the bytes. The following is an example of an SDS Ethernet (MAC) address:



Assigning an IP address

Every device that communicates over the Internet must have a unique IP address. You can assign an IP address to your SDS by either of two methods:

- Through the Installation Wizard for initial configuration
- Through the Web interface for reconfiguration and maintenance

Using Port numbers

Note: You can think of the IP address as a telephone number and the port number as a telephone extension.

Note: This information is useful for firewall configuration.

In order for devices to communicate via a TCP connection or a UDP datagram, they must know each other's IP address and port number. The SDS driver automatically sets the unit's port number for you.

A specific port number identifies each SDS serial port. An SDS assigns a port number of 5000 to the first port, and then increments the port number sequentially for each subsequent serial port. SDS drivers must see the first port as IP address: 5000.

Identifying operating modes

Normal, Tunneling, Raw TCP, Auto TCP, and Raw UDP are all different schemes to make a serial connection across a network using one or more Serial Device Servers.

Normal mode

Note: Normal is the standard connection mode for an SDS.

If you use Quatech's virtual COM port drivers or the IntelliSock™ SDK (see TCP socket services – IntelliSock™ on page 6), you should use the Normal mode to make your network connections. Normal mode is used in the vast majority of applications. Unless you are certain that you need to use a different mode, go ahead and configure your SDS in Normal mode. This mode allows for complete software control of the serial port by an application program.

Tunneling mode

Note: In Tunneling, a master sends out the configuration information to a slave so that the slave can communicate with it.

Serial Tunneling allows two Device Servers and their Ethernet TCP/IP connection to act like a direct cable connection between two serial devices. No host computer is required.

Tunneling is very simple to use. Using the SDS' web interface, designate one SDS' serial port as the tunneling master and the other SDS' port as the tunneling slave. Configure the master with the serial port settings desired for the connection as well as the IP address of the tunneling slave. The master makes the connection and automatically configures the slave with the corresponding settings.

Raw TCP mode

Note: You could use Raw TCP if you were running a simple, custom TCP application.

In Raw TCP mode, serial port data travels over the TCP/IP connection without any protocol wrapper. You must configure the serial port settings using the SDS' web interface. Raw TCP mode works with most third party universal serial device server drivers.

Auto TCP mode

Note: Auto TCP is the only communication mode that lets an SDS initiate the connection.

Auto TCP mode is a special case of Raw TCP mode that allows the SDS to act as a network client and to initiate a TCP connection to a network host. You can configure the SDS so that it makes the connection in one of two possible instances:

- It receives serial data (Data mode).
- It sees that the DSR input is active (DSR mode).

As with Raw TCP mode, you must configure the serial port settings using the SDS' web interface. You must configure the SDS with the

IP address and TCP port number of the network host to which it should connect. If the SDS is idle, it will listen for normal Raw TCP mode connections from the network host.

Raw UDP mode

Note: Raw UDP can provide one-to-many communications.

Raw UDP is used primarily for broadcasting messages over a network. It is lightweight and efficient; however, your application program must handle all error processing and retransmission. Quatech supports the following modes of UDP communication:

- Multicast (transmits to specified group of recipients)
- Broadcast (transmits to unspecified recipients)
- Point-to-Point (transmits to one recipient)

Identifying Quatech's SDS product line

Quatech provides a family of SDS products. SSE-100, DSE-100, QSE-100, and ESE-100 provide one, two, four, and eight RS-232 ports for your serial devices, respectively. SSE-400, DSE-400, QSE-400, and ESE-400 allow you to software-select between RS-232 and RS-422/485 communications. For convenience, this manual refers to all these products as SDS unless otherwise noted.

Note: All models are available with surge suppression as an –SS option. For example, the 4-port RS-232 unit with DB-9 connectors and surge suppression would have a part number of QSE-100D-SS.

Table 1 - SDS models

RS-232 Device	Ports	RS-232/422/485 Device
SSE-100	1	SSE-400
DSE-100	2	DSE-400
QSE-100	4	QSE-400
ESE-100	8	ESE-400

Note: SDS products with a "W" in their part numbers (such as SSEW-100) implement Wi-Fi technology. They provide serial-to-wireless communications in addition to all standard SDS functions.

Quatech's SDS products all perform the same function (see notes), differing mainly in the number of serial ports available or in the serial protocol supported. All "D" models, which add a suffix of D to the part number, (e.g. SSE-100D) are supplied with DB-9 connectors. All "M" models, which add a suffix of M to the part number, (e.g. QSE-100M) are supplied with 10-pin RJ-45 adapters that attach to the DB-9 connectors.

System requirements

Quatech's SDS ships with device drivers for Windows 2000, Windows NT4, Windows XP, and Linux. Other operating systems can access the SDS using Raw TCP mode or the IntelliSock™ TCP socket services. Quatech will provide reference materials and utilities to assist those who wish to do so.

Contact our sales department for details on current software offerings. Most device drivers are available for download from the Quatech World Wide Web site at http://www.quatech.com/.

Features

Note: Quatech Device Servers capture data from legacy serial devices without having to go through a PC.

Quatech Device Servers can connect virtually any serial device to any standard Ethernet network (Intranet or Internet) using TCP/IP protocols. The following list details some of the serial devices an SDS can bring to your fingertips:

- Security system alarm/access control devices
- Industrial computers and sensors
- Point-of-Sale (POS) peripherals
- Time clocks
- Banking peripherals and ATM machines
- Medical equipment

Protocol support

The SDS communicates over an Ethernet network using the standard IP and TCP protocols to ensure data integrity and accurate targeting. An SDS supports the following protocols:

- Network addressing, routing, and data block handling: IP
- Network communications: TCP, UDP, DHCP, HTTP, and ARP
- Network management: SNMP

SNMP Network management support

Note: Only SDS devices with a firmware revision level of 5.0 and above can support SNMP. To determine the revision level of an SDS, check the bottom of the Home page in the Web-based interface (see page 43).

The Simple Network Management Protocol (SNMP) agent running on your SDS collects network statistics such as the amount of data transmitted and received, the number of frames that contain errors, and the speed of the interface.

A network management system consists of these four parts:

- Network manager – One or more workstations used to monitor and manage the elements comprising a network
- Managed system – Composed of managed devices on the network running the agent process, such as an SDS
- Management Information Base (MIB) – Standard organization scheme for storing data records; an SDS device with a firmware revision of 5.0 and above supports MIB-II
- Network management protocol – SNMP is a set of rules governing the exchange of management information between a network manager and the elements of a managed system

Note: SNMP is used to communicate status updates and parameter values between a remote device such as an SDS and a network manager.

The SDS supports MIB II, which is a standard set of statistics. It includes information on system interfaces, address translation, IP, ICMP, TCP, UDP, transmission, and SNMP group information.

Note: The SDS is a read-only device. You cannot set any parameters via SNMP.

For example, the agent running on the SDS collects network statistics including the amount of data transmitted and received, the number of frames that contain errors, the percentage of utilization of the network, maximum packet size, speed, MAC address, and whether the device is up and working. The agent provides a whole tree of

Note: Traps are messages or alarms generated by an SNMP agent to indicate to the SNMP manager that a significant event has occurred.

information that a management network host can retrieve using the Get command.

In addition to providing information upon request, the SDS supports a cold start Trap, which is a spontaneous message the SDS initiates whenever it boots up.

Wi-Fi implementation

Note: Wi-Fi is a wireless Ethernet communication option.

Wi-Fi, short for wireless fidelity, allows Wi-Fi-enabled devices to connect to an Ethernet/Internet network without cables or wires. You can use a Wi-Fi network to connect these devices to each other, to the Internet, and to wired networks. Wi-Fi is a fast, powerful, reliable, and secure alternative to wired communication.

Quatech's Wi-Fi-enabled SDS devices provide serial-to-wireless network connectivity. They enable you to connect to and communicate with your serial devices over 802.11b wireless networks. These units all have a "W" incorporated in their names, such as SSEW-100 or DSEW-400.

There are two access modes you can use with your Wi-Fi SDS, depending on whether or not an access point (AP) is involved.

Note: To setup the Wireless SDS, you must first connect to it in wired Ethernet mode to obtain the IP address. Then, use the Web browser to configure the network settings for Wi-Fi communications.

See Enabling Wi-Fi Device Servers on page 14 for details on installing and configuring your wireless SDS.

- Infrastructure uses an access point to link the SDS to other network devices.
  For example, an SDS connected to a POS device by a serial cable will send and receive POS data through an AP to a wireless network. Any PC connected to that network (either by a wired connection or via an AP) can communicate directly with the POS device. Optional WEP and WPA security protocols can encrypt data to protect it during transmission from the SDS to an AP.
- Ad hoc directly links a SDS with another device without going through an access point. For example, if you connect a security camera's serial port to an SDS, a wireless PC can connect directly to the security camera through the SDS without ever going through an AP.

Before an SDS can communicate on an 802.11b wireless network, the WLAN settings must match those of the wireless network. By default, an SDS is set to Infrastructure network mode and its wireless Network Name (SSID) is blank, which will allow it to connect to any available wireless network.

TCP socket services – IntelliSock™

Note: Quatech's IntelliSock™ provides the most flexible and powerful TCP socket services available for custom applications.

Note: If you do not need the power of the IntelliSock interface, the Raw TCP mode provides a simple way of using a direct TCP connection with the SDS.

The SDS implements Quatech's IntelliSock™ TCP socket services. Quatech supplies device drivers for Windows 2000, NT4, XP, and Linux to make the SDS look like it is a built-in COM port.

IntelliSock offers you the option of interfacing directly to the SDS through a TCP socket programming interface rather than using the virtual COM port device drivers. IntelliSock can be used with any operating system that supports TCP/IP communication.

Refer to the IntelliSock Software Developer's Kit (SDK) folder on the installation CD-ROM for documentation and sample code.

Getting started

Unpacking your SDS

Follow these steps to unpack your SDS.

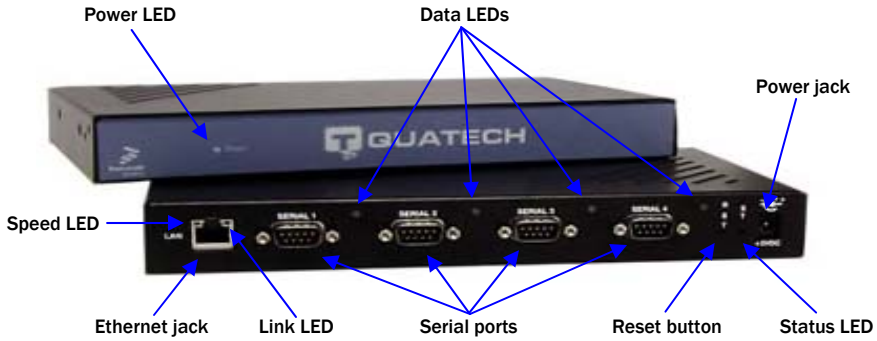
Step	Procedure	Description
❑ Step 1	Remove the SDS from the box.	
❑ Step 2	Remove all packing material from the SDS.	*Save the packaging in case you ever need to store the unit or return it to Quatech for service.*
❑ Step 3	Check the contents of the package to make sure you have received everything listed below: ➢ *SDS* ➢ *Power cable* ➢ *Power source* ➢ *Loopback connector(s)* ➢ *CD-ROM containing the SDS device drivers and configuration software* ➢ *Quick Start Guide*	*The complete SDS package ships in a single box.*
❑ Step 4	Check the SDS and accessories for shipping damage.	*Pay particular attention to the SDS' case and port connectors. If anything is missing or damaged, contact your Quatech sales representative.*

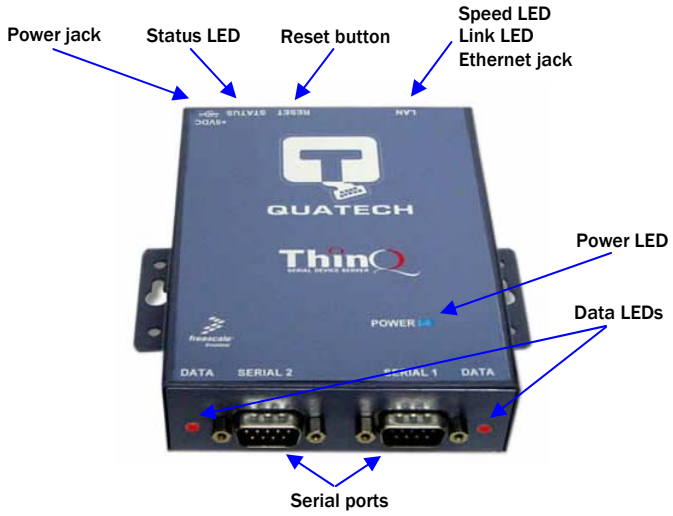
Identifying parts

Figure 1 shows the connectors and indicator lights (LEDs) of the SDS. See below for a description of each item shown.

The actual number and location of serial ports will vary according to the model.

Figure 1 – Connectors and Indicators





The SDS has several indicator LEDs:

- Power (blue) – indicates when the SDS has line power
- Data (red/green) – indicates serial port data activity by blinking red for RS-232 or green for RS-422/485
- Status (green) – indicates when the embedded processor is up and running
- Link (green) – indicates when a network link has been established; located in the Ethernet connector
- Speed (amber) – differentiates between 100Base-T (glowing) and 10Base-T (off) Ethernet connection speeds; located in the Ethernet connector

The DB-9 serial port(s) connect to your serial device(s) and can support RS-232, RS-422, or RS-485 connections. They are located either to the left, to either side of the Ethernet port, or on the front panel, depending on the model.

The RJ-45 Ethernet jack connects the SDS to the Internet or to your Intranet. It has two small status LEDs: Link (green) and Speed (amber).

The power jack should be connected to a +5V power source, as provided with the SDS.

The Reset button puts the SDS through a reset cycle and can also restore the SDS to the factory default settings.

The information label (not shown) is on the bottom of the SDS. It includes the following:

- MAC address
- Serial number
- Certifications
- Pinout diagram

Understanding LED codes

The SDS LEDs inform you of the communications status and activity of the SDS. The following table lists the possible states of the LEDs and their meaning.

Table 2 - SDS LED codes

LEDs	Meaning
Link (green)	On steady = connected to network On steady for Wi-Fi SDS units: ➢ *Infrastructure = SDS is associated with Access Point* ➢ *Ad hoc = SDS has found device to communicate with*
Speed (amber)	Off = 10 Mbps network connection established if Link LED is on On steady = 100 Mbps network connection established
Data (red/green)	Red = RS-232 connection Green = RS-422/485 connection Blinking = data activity
Status (green) The Status LED also works in conjunction with the Reset button as follows:	On = SDS is up and running
1. To restore the SDS to the *factory default configuration*, push in and hold the Reset button. When the Status LED starts flashing slowly, and before it starts flashing rapidly, release the button. The SDS then restarts automatically.	*If the Reset button is held during the first 10 seconds of bootup, the Status LED flashes at a rate of 1 flash every 2 seconds for 10 seconds. If the button is released during this time period, the configuration is reset to factory defaults.*
2. To restore the SDS to the *factory default firmware revision*, push in and hold the Reset button. When the Status LED changes from a slow flash to a rapid flash, release the button. The SDS then restarts automatically.	*If the Reset button is held past the first 10 seconds of bootup, the LED flashes faster at a rate of 1 flash every second for 10 seconds. If the button is released during this time period, the SDS is reset back to the factory default firmware revision.*

Note: If you press and immediately release the Reset button, the SDS restarts automatically with no changes. Also, if you continue holding the Reset button longer than 20 seconds, the Status LED stops flashing and no changes are made.

Locating serial and network ports

Serial port(s)

Note: The location of the serial port(s) varies, depending on the model.

SDS serial ports connect via cables to your serial device(s). The number of these ports will vary depending on the SDS model. All SDS models come with DB-9 serial port connectors. RS-232 "M" models include adapter plugs to convert the DB-9 connectors to RJ-45 connectors. See Making connections on page 13 for directions on connecting an SDS serial port to a serial device.

The following figures and tables show the serial port pinouts for RS-232 and RS-232/422/485 applications.

Figure 3 and Tables 3 and 4 show the RS-232/422/485 DB-9 pinouts and signal descriptions.

Figure 2 - DB-9 pinouts

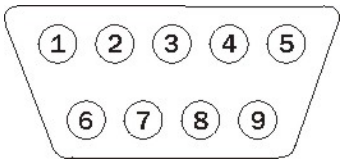


Table 3 - RS-232 signals on DB-9 connector

RS-232 signal description	DB-9
Data Carrier Detect (DCD)	1
Receive Data (RxD)	2
Transmit Data (TxD)	3
Data Terminal Ready (DTR)	4
Signal Ground (GND)	5
Data Set Ready (DSR)	6
Request To Send (RTS)	7
Clear To Send (CTS)	8
Ring Indicator (RI)	9

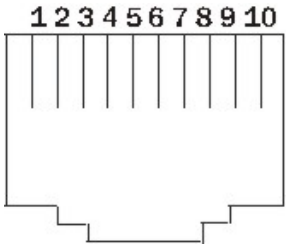
Table 4 - RS-422/485 signals on DB-9 connector

Note: Pins labeled NC are indeterminate in two-wire mode and should be left unconnected.

RS-422/485 signal description four-wire mode	DB-9	RS-422/485 signal description two-wire mode
Auxiliary Input (AuxIn–)	1	NC
Receive Data (RxD+)	2	NC
Transmit Data (TxD+)	3	Transmit/Receive Data (Data+)
Auxiliary Output (AuxOut–)	4	NC
Signal Ground (GND)	5	Signal Ground (GND)
Receive Data (RxD–)	6	NC
Auxiliary Output (AuxOut+)	7	NC
Auxiliary Input (AuxIn+)	8	NC
Transmit Data (TxD–)	9	Transmit/Receive Data (Data–)

Figure 4 and Tables 5 and 6 show the RS-232/422/485 -RJ-45 pinouts and signal descriptions.

Figure 3 - RJ-45 pinouts (DB-9 to RJ-45 adapter)



Note: If your serial port cable uses an 8-pin RJ-45 plug, you can use the center eight pins of the SDS' RJ-45 connector for RS-232 communications. You will lose access to the Ring Indicator signal.

Table 5 - RS-232 signals on RJ-45 connector (DB-9 to RJ-45 adapter)

RS-232 signal description	RJ-45
Ring Indicator (RI)	1
Request To Send (RTS)	2
Data Terminal Ready (DTR)	3
Signal Ground (GND)	4
Transmit Data (TxD)	5
Receive Data (RxD)	6
Data Carrier Detect (DCD)	7
Data Set Ready (DSR)	8
Clear To Send (CTS)	9
No Connection	10

Note: Pins labeled NC are indeterminate in two-wire mode and should be left unconnected.

Table 6 - RS-422/485 signals on RJ-45 connector (DB-9 to RJ-45 adapter)

RS-422/485 signal description four-wire mode	RJ-45	RS-422/485 signal description two-wire mode
Transmit Data (TxD–)	1	Transmit/Receive Data (Data–)
Auxiliary Output (AuxOut+)	2	NC
Auxiliary Output (AuxOut–)	3	NC
Signal Ground (GND)	4	Signal Ground (GND)
Transmit Data (TxD+)	5	Transmit/Receive Data (Data+)
Receive Data (RxD+)	6	NC
Auxiliary Input (AuxIn–)	7	NC
Receive Data (RxD–)	8	NC
Auxiliary Input (AuxIn+)	9	NC
No Connection	10	No Connection

Network port

All SDS devices have one eight-pin RJ-45 Ethernet port on the back panel.

Figure 5 and Table 7 show the Ethernet RJ-45 pinouts and signal descriptions.

Figure 4 - RJ-45 Ethernet port pinout

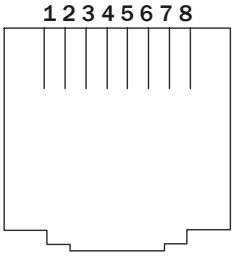


Table 7 - RJ-45 Ethernet port signals

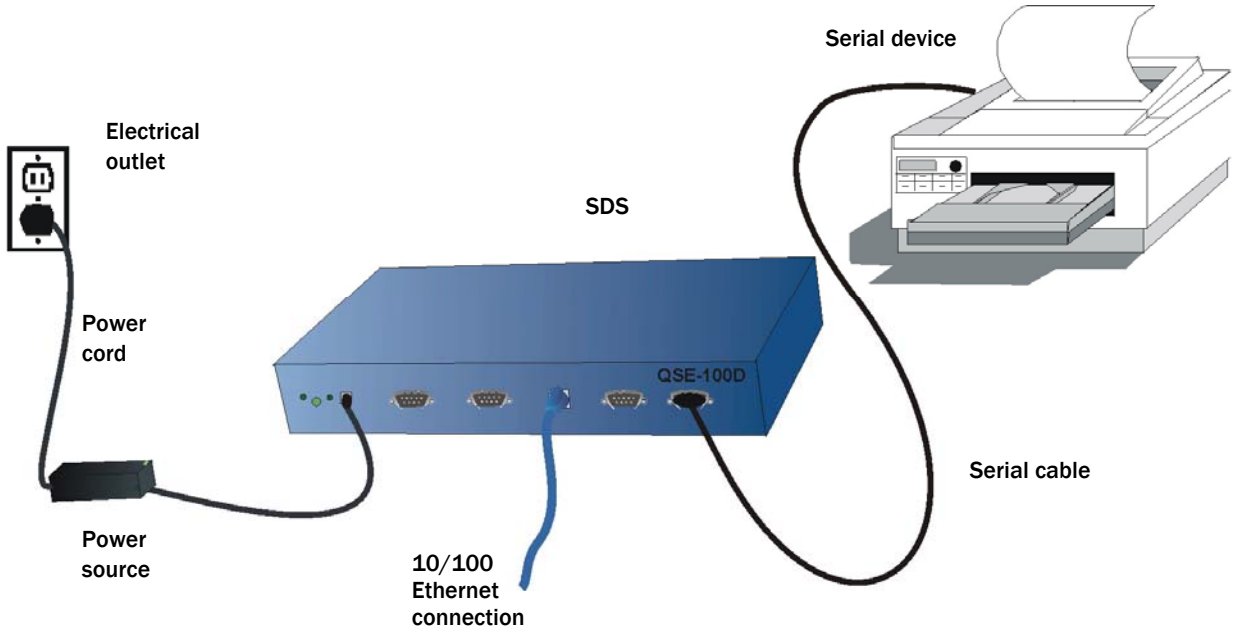
Ethernet signal description	RJ-45
Transmit Data (TxD+)	1
Transmit Data (TxD–)	2
Receive Data (RxD+)	3
No connection	4, 5
Receive Data (RxD–)	6
No connection	7, 8

Making connections

Figure 6 shows a four-port SDS connected to a printer.

You can easily connect each serial port on your SDS to any serial device that you want to make accessible to an Ethernet network.

Figure 5 - Connecting an SDS to a serial device



Follow these steps to connect your SDS to one or more serial devices.

Step	Procedure	Description
❑ Step 1	Make sure the serial device you are connecting to the SDS is turned off.	*The SDS should be unplugged.*
❑ Step 2	Connect a serial cable between the SDS and your serial device.	*See Serial port(s) on page 10 for pinout and connector information.*
❑ Step 3	Connect an Ethernet cable between your Ethernet outlet and the SDS' 10/100 port.	*The Ethernet port is located on the back panel.*
❑ Step 4	Insert the power source jack into the power plug on the back of the SDS.	*An SDS requires a 5-VDC, 2-A (10-W max) power source. The power source ships with the SDS.* *Note: These are the available power cables:* *920-0111-01A Std North America* *920-0112-01A Std Continental Europe* *920-0113-01A Std United Kingdom* *920-0114-01A Std Australia*
❑ Step 5	Plug the power source into a wall socket.	*The SDS powers up automatically.*
❑ Step 6	Power up the serial device.	*Now you are ready to install the device drivers!*

Enabling Wi-Fi Device Servers

Note: Wi-Fi Device Servers link via an AP in Infrastructure mode; they connect directly to another device in Ad hoc mode.

Note: In Ad hoc mode, the Link LED on the Ethernet port will glow green when your wireless SDS finds and communicates with another device.

Quatech's Wi-Fi Device Servers need to have a wireless network connection established before they can be configured for use. To enable the wireless connection, you need to obtain the SDS' IP address as outlined below. Once you have the IP address, you can configure the SDS for wireless communications via the Web interface.

In Infrastructure mode, you can use your wireless SDS just as you would a wired SDS, but it will communicate via an access point on the 801.11b network rather than through an Ethernet cable. The SDS will scan all channels until it finds an AP, at which time the Link LED on the Ethernet port will glow green.

The following briefly describes how to obtain the IP address of the SDS and to enable wireless communications. For greater detail, see Installing the device drivers on page 16 and Setting network parameters on page 47.

Step	Procedure	Description
❑ Step 1	Turn on the power to your computer system.	
❑ Step 2	Insert the Quatech SDS installation CD-ROM into your CD-ROM drive.	*If the CD-ROM does not launch automatically, select Start – Run from the Task bar, browse to the CD-ROM drive, and select the ThinQ.exe file. Click "OK" in the Run window to launch the installation.*
❑ Step 3	From the Main Menu, select Install SDS. Click Next.	
❑ Step 4	Connect the Ethernet port on your SDS either to the NIC port on your computer or to a switch/hub.	*Use a CAT5 or better Ethernet cable to attach the SDS.*
❑ Step 5	Connect power to the SDS. When the SDS is ready, click the Next button to search for Serial Device Servers.	*When the SDS is ready, the Status, Power, and Link LEDs should glow.*
❑ Step 6	When the search is finished, find your SDS and make note of its IP address. Press Cancel to abort the installation procedure.	*You will need this address for the network configuration.*
❑ Step 7	Open your Web browser and type the IP address for the SDS in the Web browser's URL (address) field.	*The Quatech Device Server Home page displays.*
❑ Step 8	Click on Network in the selection bar.	
❑ Step 9	Select Infrastructure as the Access Mode.	
❑ Step 10	Configure the Device Server's SSID to match the access point's SSID.	*To communicate wirelessly, the AP and the SDS must both use the same SSID. If you don't know the proper SSID, check with your system administrator.* *Note: The Channel setting is only used in Ad hoc mode. In Infrastructure mode, the AP determines the channel.*
❑ Step 11	Press Submit to configure the SDS with your settings.	*The IP Address Update successful screen displays.*
❑ Step 12	Reset the SDS.	*Click on the link to perform a remote reset, and then press Reset.*
❑ Step 13	Remove the Ethernet cable from the SDS *during the reset process.*	*Be sure to remove the Ethernet cable before the reset process is finished.*
❑ Step 14	Leaving the Ethernet port unconnected, perform the procedure shown in Installing the device drivers starting on page 16, skipping □ Step 6.	*When you are finished, you are ready to install your wireless SDS in its final location. For details on connecting your wireless SDS to a serial device, see Making connections starting on page 13, skipping □ Step 3.*

Installing the device drivers

Note: You must install the drivers on the installation CD-ROM on every computer that accesses the device(s) attached to the SDS.

Hint: Click on **Go to □ Step** in the rightmost column to jump to your next step.

This section explains how to install the SDS software under the Windows 2000, Windows NT4, and Windows XP operating systems.

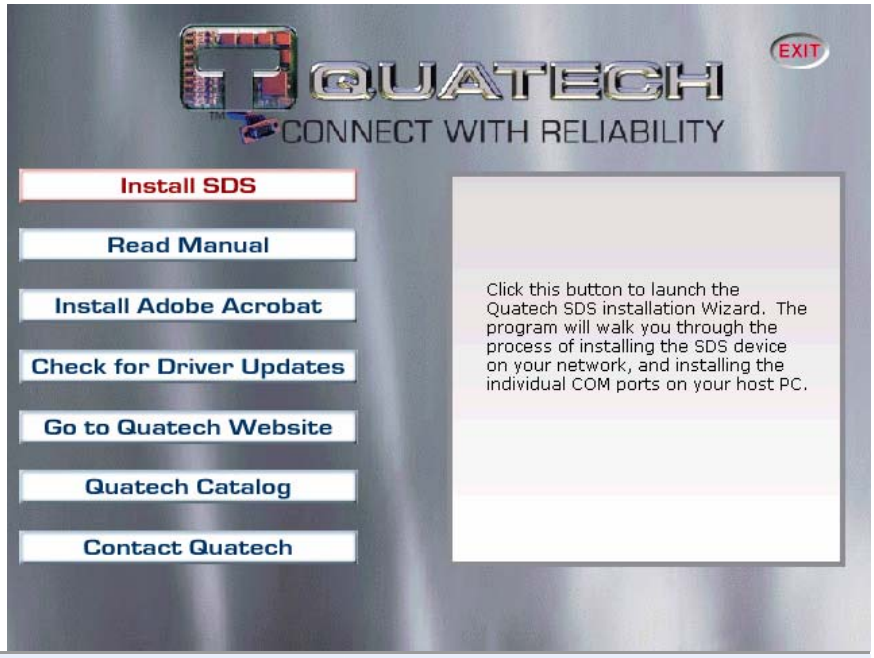
The Quatech Device Server Install Wizard helps you to add new SDS hardware. It takes into account a variety of circumstances and directs you to jump to different Steps as needed. Click on the blue "**Go to □ Step**" text in the *Description* column to automatically jump to that step. Continue from that point until you are directed to a different location.

Step	Procedure	Description
☐ Step 1	Turn on the power to your computer system.	*This is the client PC in which the SDS drivers are to be installed.*
☐ Step 2	Insert the Quatech SDS installation CD-ROM into your CD-ROM drive.	*This is the CD that shipped with the SDS.*
☐ Step 3	The CD-ROM should launch automatically.	*The Quatech Serial Device screen displays, followed by the Main Menu screen.* ***Continue with □ Step 4.***
	If the CD-ROM does not launch automatically, select Start – Run from the Task bar, browse to the CD-ROM drive, and select the ThinQ.exe file. Click "OK" in the Run window to launch the installation.	*The Quatech Serial Device screen displays, followed by the Main Menu screen.* ***Continue with □ Step 4.***

Figure 6 - Main Menu screen

Figure 7 illustrates the Quatech Install Wizard's Main Menu screen. The Wizard helps you to install the drivers and configure the SDS. This installation adds the SDS to the devices in the Windows Device Manager under Multi-port serial adapters and installs the serial port(s) as it would a standard COM port(s) under Ports (COM & LPT).

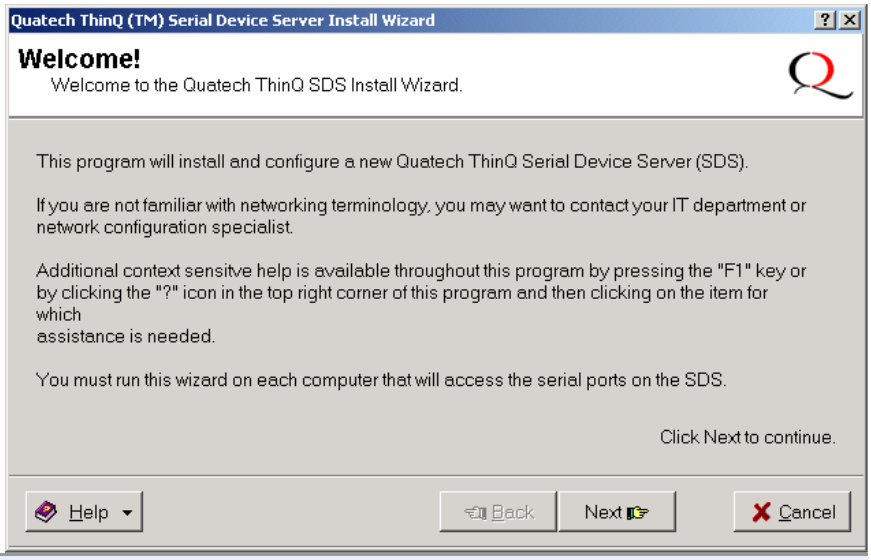
Note: Press the Help key for additional information as you go through the installation procedure.



Step	Procedure	Description
☐ Step 4	From the Main Menu, select Install SDS.	*The Quatech Install Wizard launches and displays the Welcome screen.* ***Continue with □ Step 5.***

Figure 8 illustrates the Quatech Install Wizard's Welcome screen.

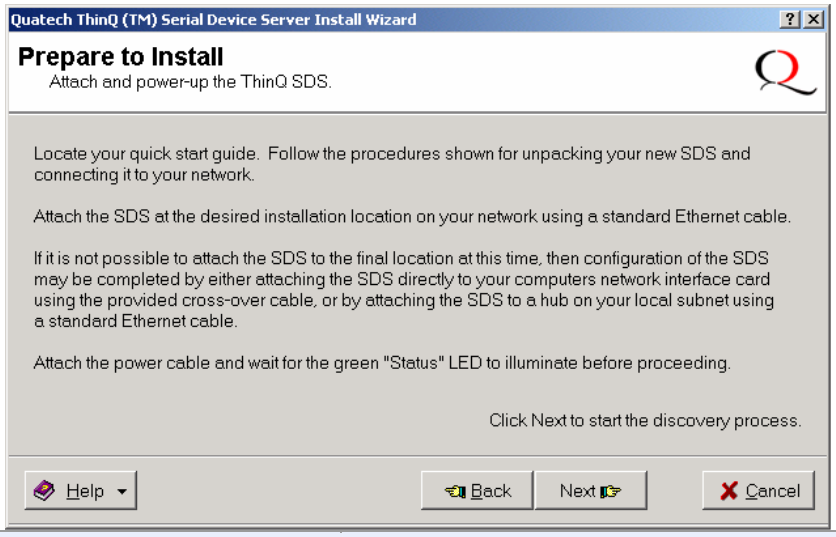
Figure 7 - Welcome screen



Step	Procedure	Description
☐ Step 5	Click the Next button to continue.	*The Prepare to Install screen displays.* ***Continue with □ Step 6.***

Figure 9 illustrates the Prepare to Install prompt. Be sure to read this screen carefully before proceeding.

Figure 8 - Prepare to Install screen



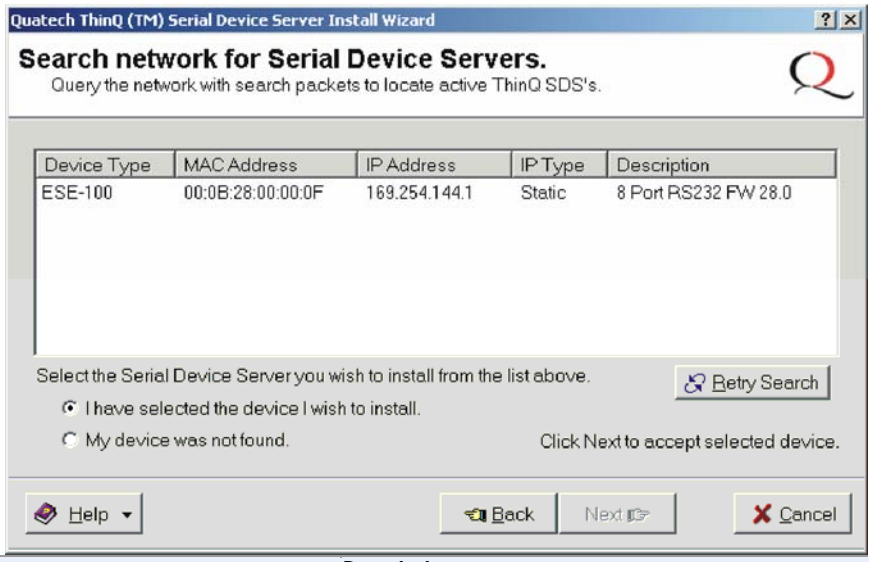
Note: Press the Help key for additional information as you go through the installation procedure.

Step	Procedure	Description
☐ Step 6	Connect the Ethernet port on your SDS to one of the following: ➢ *Desired installation location,* ➢ *Hub on your local subnet, or* ➢ *Network Interface Connection (NIC) on your computer using an Ethernet crossover patch cable.*	*If you cannot immediately attach the SDS to the target installation site, temporarily attach it to the local hub or your computer's NIC for configuration purposes.* *Notes: Use a CAT5 or better Ethernet cable to attach the SDS to your network.* *If your SDS is pre-configured for your network, attach it now to the appropriate subnet location.* ***Continue with □ Step 7.***

Step	Procedure	Description
☐ Step 7	Connect power to the SDS.	*Connect the cable attached to the power source to the SDS. Plug the connector of the unattached power cable into the power source's socket. Plug the other end of the cable into a power outlet. The SDS powers up and the blue Power LED lights.*
☐ Step 8	Confirm that the SDS is ready to proceed.	*The Status LED to the left of the power jack should glow green. The Power LED should glow blue and the Link LED should glow green.*
☐ Step 9	Click the Next button to search for device servers.	*The Search network for Serial Device Servers screen displays and the Wizard searches the local subnet for active serial device servers.* ***Continue with □ Step 10.***

Figure 9 - Search network for Serial Device Server(s) screen

Figure 10 shows the search results for all active device servers on the local subnet.



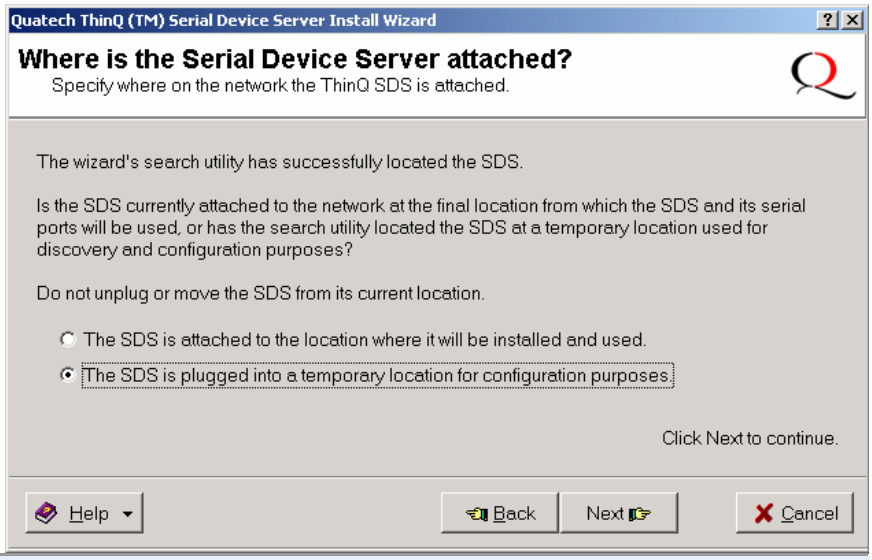
Step	Procedure	Description
☐ Step 10	When the search is completed, look in the list of detected devices.	
	➢ If you find your SDS, highlight it and click on *I have selected the device I wish to install.* Press Next.	***Continue with □ Step 11.***
	➢ If you do not see your SDS, click on the Retry Search button. If it still is not found, click on *"My device was not found."* Press Next.	*The Locate the Serial Device Server screen displays.* **Go to □ Step 42.**

Step	Procedure	Description
☐ Step 11	One of two possible screens displays:	
	➢ *Where is the Serial Device Server attached?*	*If your SDS is directly connected to your computer or to the local subnet, the Where is the Serial Device Server attached screen displays.* ***Continue with □ Step 12.***
	➢ *Reconfigure the Serial Device Server*	*If your SDS is remotely connected, the Wizard offers you the option to change the configuration and move the SDS to the subnet where it will be permanently installed. The Reconfigure the Serial Device Server screen displays.* **Go to □ Step 30.**

Figure 10 - Where is the Serial Device Server attached screen

Figure 11 asks you to specify whether the SDS is in its final installation location of if it is temporarily installed while you configure it.

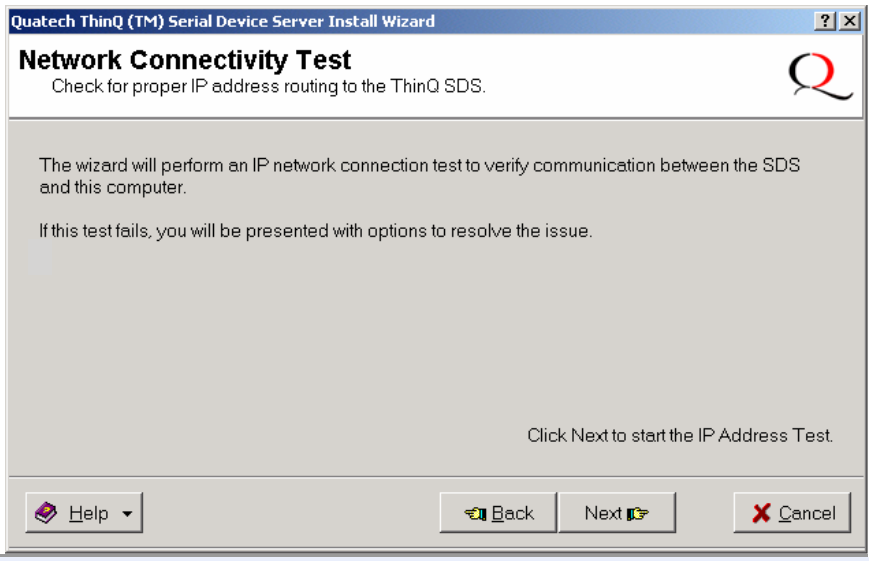
Caution! Do not unplug or move the SDS at this time.



Step	Procedure	Description
☐ Step 12	Select one of two options:	
	➢ *The SDS is attached to the location where it will be installed and used.*	*Choose this option if the SDS is installed where you intend to use it.* ***Continue with □ Step 13.***
	➢ *The SDS is plugged into a temporary location for configuration purposes.*	*Choose this option if you need to move the SDS to another location before using it.* ***Continue with □ Step 13.***
☐ Step 13	Press Next to continue. One of two possible screens displays:	
	➢ *Network Connectivity Test*	*If your SDS is installed in its final location, the Network Connectivity Test screen displays.* ***Continue with □ Step 14.***
	➢ *Reconfigure the Serial Device Server*	*The Wizard helps you to configure and move the SDS to its permanent spot.* **Go to □ Step 30.**

Figure 11 - Network Connectivity Test screen

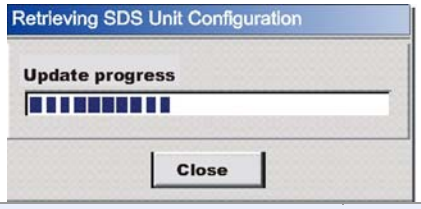
Figure 12 shows the Network Connectivity Test prompt. This prompt informs you that the Wizard is ready to check the IP connectivity of the SDS.



Step	Procedure	Description
☐ Step 14	Press the Next button to run the IP connectivity test.	*The Retrieving Unit Configuration pop-up box displays briefly.* ***Continue with □ Step 15.***

Figure 12 - Retrieving Unit Configuration pop-up box

Figure 13 shows the Retrieving Unit Configuration pop-up box. This box shows the configuration retrieval progress and closes when it is complete.



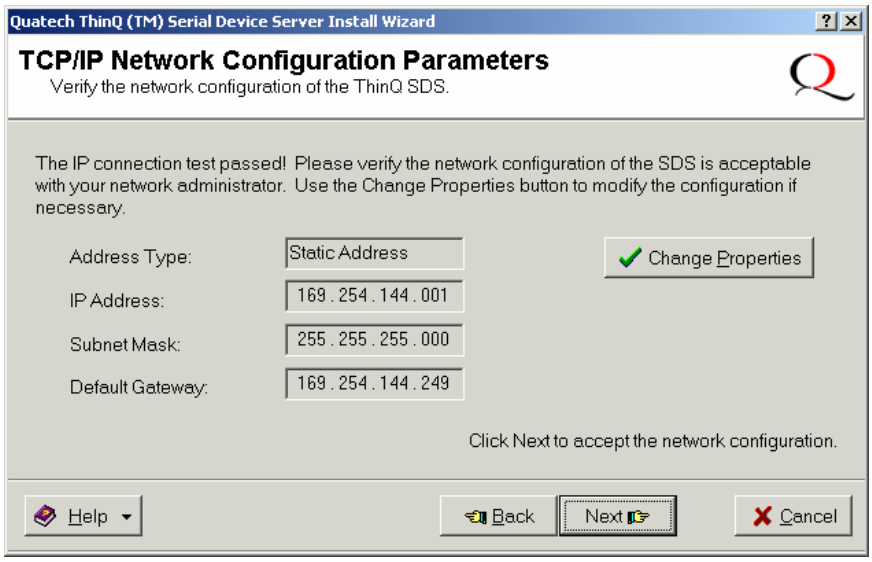
Step	Procedure	Description
☐ Step 15	Depending on whether the test passes or fails, one of two screens displays:	
	➢ *TCP/IP Network Configuration Parameters*	*If the test passes, the TCP/IP Network Configuration Parameters screen displays.* ***Continue with □ Step 16.***
	➢ *Network Connectivity Test Failed*	*If the test fails, the Network Connectivity Test Failed screen displays.* **Go to □ Step 55.**

Figure 14 shows the following TCP/IP network configuration parameters:

- Address type
- IP Address
- Subnet mask
- Default gateway

***Caution! If your address type is* Dynamic*, the Wizard asks you to confirm that you want the DHCP server to assign the IP address for your SDS. Be aware that if your DHCP server is not configured to assign the same address to the SDS every time,* communication with the SDS may fail should the SDS ever be reset.**

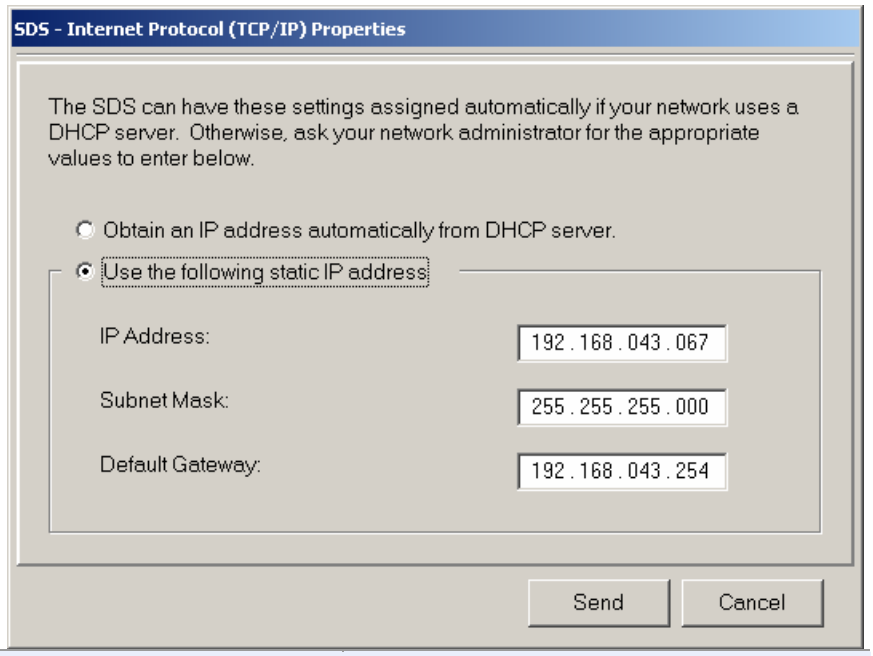
Figure 13 - TCP/IP Network Configuration Parameters screen



Step	Procedure	Description
☐ Step 16	Note the TCP/IP configuration parameters.	*The SDS initially ships with a DHCP address type.* *Note: If the SDS is attached to a network utilizing a DHCP server, it will ask for and obtain a valid IP address from that server. If not, the SDS will default to the IP address 192.168.192.168.*
	➢ If you need to change the parameters, press the Change Properties button.	*The Internet Protocol (TCP/IP) Properties dialog box displays.* ***Continue with □ Step 17.***
	➢ If you are satisfied with the parameters, press the Next button. One of two possible screens displays, depending on whether your address type is:	
	Static Address *or* **Assigned by DHCP**.	*If your address type is* ***Static Address****, the Install the Device Drivers screen displays.* **Go to □ Step 27.** *If your address type is* ***Assigned by DHCP****, the DHCP server will assign an IP address for your SDS. The DHCP confirmation pop-up box displays.* **Go to □ Step 40.**

Figure 15 shows the current configuration parameters for the SDS. You can change these parameters by keying in the desired values.

Figure 14 - Internet Protocol (TCP/IP) Properties dialog box



Step	Procedure	Description
☐ Step 17	The Internet Protocol Properties (TCP/IP) dialog box lets you change the SDS configuration so that it can operate in its permanent location. Select one of the following options: ➢ *Use the following static IP address.* ➢ *Obtain an IP address automatically from the DHCP server.*	*If you are not sure of the configuration parameters, consult your system administrator.* *Note: For reliable operation, we recommend a static IP address.* ***Continue with □ Step 18.*** **Go to □ Step 19.**
☐ Step 18	Key in any necessary changes to the: ➢ *IP address,* ➢ *Subnet mask,* and ➢ *Default gateway.*	*If you are not sure of the configuration parameters, consult your system administrator for the specific parameters.*
☐ Step 19	Press Send to send your changes to the SDS.	*The Restart confirmation pop-up box displays.* ***Continue with □ Step 20.***

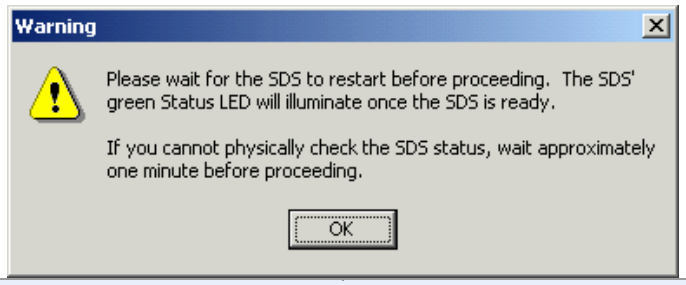
Figure 15 - Restart confirmation pop-up box

Figure 16 shows the Restart confirmation pop-up box.

Step	Procedure	Description
☐ Step 20	Press OK to restart the SDS and make your changes active.	*The SDS reboots and takes on the new configuration. The Information pop-up box displays.* ***Continue with □ Step 21.***

Figure 16 - Information pop-up box

Figure 17 warns you that the SDS needs time to reset. Wait until the Status LED glows green, and then press OK.

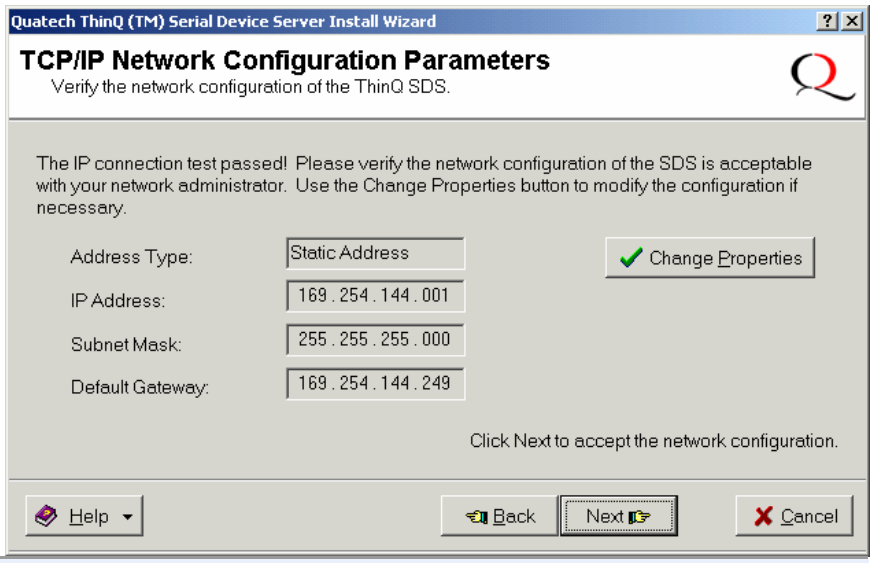


Step	Procedure	Description
☐ Step 21	When the Status light glows green, press OK.	*The glowing Status light indicates that the SDS is ready. The TCP/IP Network Configuration Parameters screen displays.* ***Continue with □ Step 22.***

Figure 17 - TCP/IP Network Configuration Parameters screen

Figure 18 shows the TCP/IP network configuration parameters including the following:

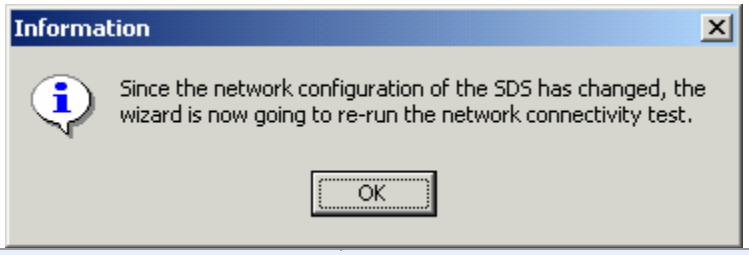
- Address type
- IP Address
- Subnet mask
- Default gateway



Step	Procedure	Description
☐ Step 22	Press the Next button to continue.	*The Rerun network connectivity test pop-up box displays.* ***Continue with □ Step 23.***

Figure 18 - Rerun network connectivity test pop-up box

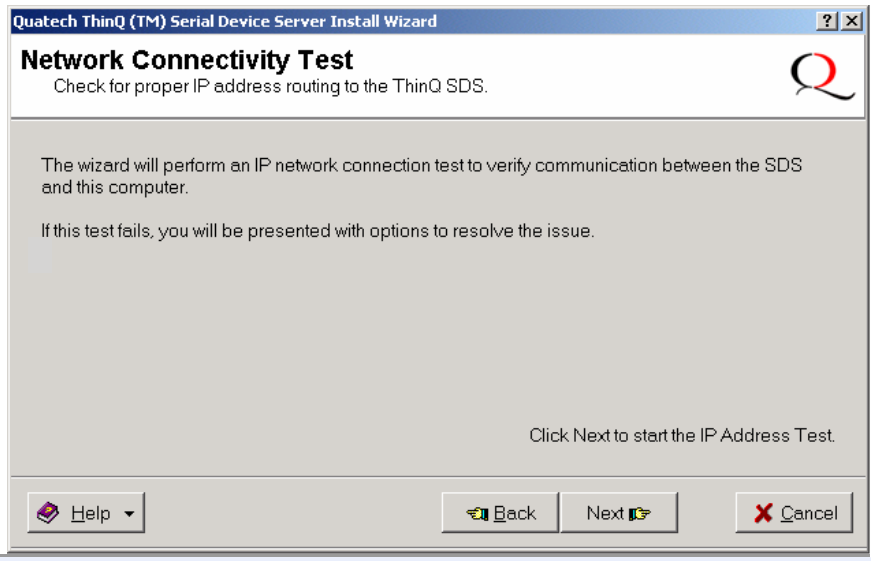
Figure 19 shows the Rerun network connectivity test pop-up box.



Step	Procedure	Description
☐ Step 23	Press the OK button to continue.	*The Network Connectivity Test screen displays.* ***Continue with □ Step 24.***

Figure 19 - Network Connectivity Test screen

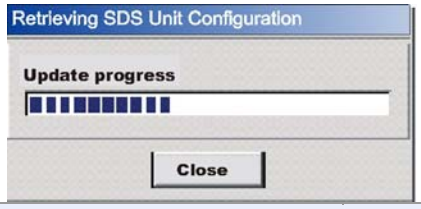
Figure 20 shows the Network Connectivity Test prompt. This prompt informs you that the Wizard is ready to check the IP connectivity of the SDS.



Step	Procedure	Description
☐ Step 24	Press the Next button to run the IP connectivity test.	*The Retrieving Unit Configuration pop-up box displays briefly.* ***Continue with □ Step 25.***

Figure 20 - Retrieving Unit Configuration pop-up box

Figure 21 shows the Retrieving Unit Configuration pop-up box. This box shows the configuration retrieval progress and closes when it is complete.

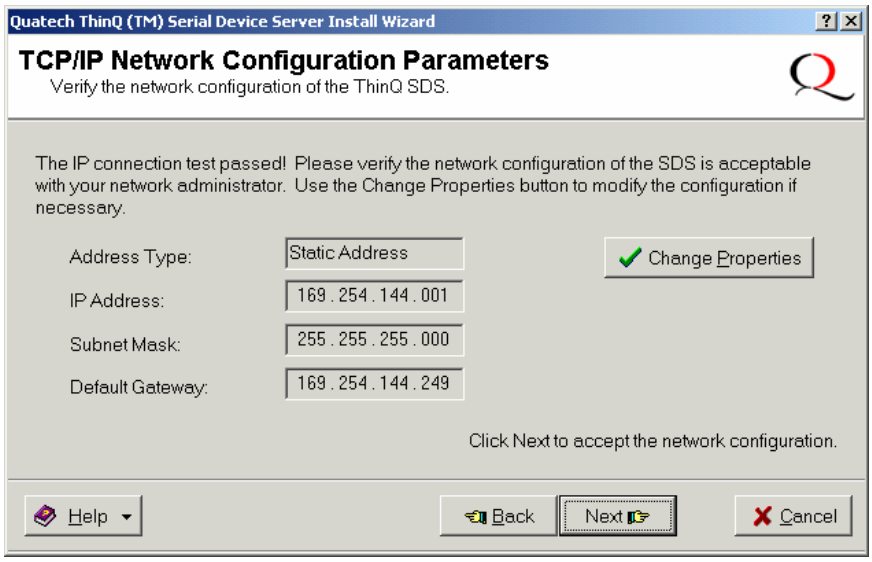


Step	Procedure	Description
☐ Step 25	Depending on whether the test passes or fails, one of two screens displays:	
	➢ *TCP/IP Network Configuration Parameters*	*If the test passes, the TCP/IP Network Configuration Parameters screen displays.* ***Continue with □ Step 26.***
	➢ *Network Connectivity Test Failed*	*If the test fails, the Network Connectivity Test Failed screen displays.* **Go to □ Step 55.**

Figure 21 - TCP/IP Network Configuration Parameters screen

Figure 22 shows the TCP/IP network configuration parameters including the following:

- Address type
- IP Address
- Subnet mask
- Default gateway



***Caution! If your address type is* Dynamic*, the Wizard asks you to confirm that you want the DHCP server to assign the IP address for your SDS. Be aware that if your DHCP server is not configured to assign the same address to the SDS every time,* communication with the SDS may fail should the SDS ever be reset.**

Step	Procedure	Description
☐ Step 26	Press the Next button to continue.	*The Install the Device Drivers screen displays.* ***Continue with □ Step 27.***

Figure 22 - Install the Device Drivers screen

Figure 23 informs you that the Wizard is ready to install the device driver(s) and create the serial port(s).

Step	Procedure	Description
☐ Step 27	Press the Next button to continue.	*The Installation Complete screen displays.* ***Continue with □ Step 28.***

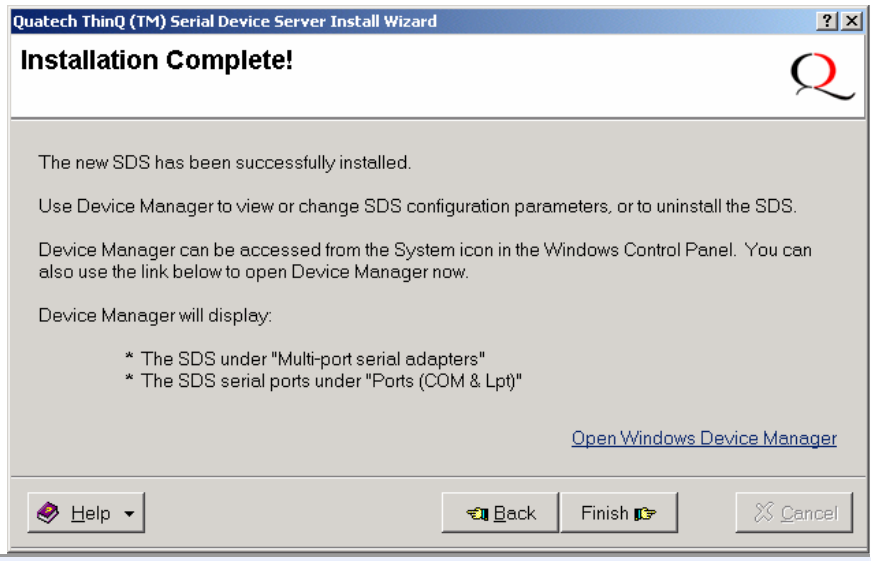
Note: If dialog boxes appear warning you that the SDS drivers are unsigned, please click through these warnings and continue with the installation. Usually, the device drivers that Quatech provides on the CDROM accompanying the SDS are signed, but occasionally we must ship unsigned drivers. In this case, please be assured that we are working to sign the drivers as soon as possible and make them available on our website.

Figure 23 - Installation Complete screen

Figure 24 illustrates the Installation Complete screen.

Note: This screen provides a link to Windows Device Manager where you can view or change the SDS configuration parameters or uninstall the SDS.

Hint: To open Device Manager at a later time, select Settings – Control Panel from the Start menu. Open the System folder and select the Device Manager tab.



Step	Procedure	Description
☐ Step 28 Win 2000/XP	(Optional) Click on the Open Windows Device Manager link to open the Device Manager panel. Click Finish to close the Installation Wizard.	*Expand the Multi-port serial adapters. Right-click the Quatech Device Server and select Properties. Click on the HTTP Connect button to launch the SDS Web interface.* *The Installation Complete screen closes. Windows briefly displays a Found New Hardware pop-up screen as it installs each serial port on the SDS. Your SDS installation is complete!*
☐ Step 28 Win NT	Win NT, only: Click Finish to launch the Quatech Device Manager Installation Wizard.	*The wizard installs Quatech's Device Manager. Follow the prompts.*
☐ Step 29 Win NT	Win NT, only: Click Finish on the Installation Complete screen when the Device Manager installation is finished.	*The SDS installation wizard closes. Your SDS installation is complete!* ***Note**: You may see a warning to reboot your machine. Do not reboot until the installation is completely finished. Note also that there is no need to reboot your machine after installing the first SDS. Only subsequent installations require rebooting.*

Win NT Device Manager

Note: Use the Device Manager only to make changes to PC-related settings, such as port numbers. Any settings related to the SDS, such as IP address, should be made only through the Web interface.

Windows NT does not provide a Device Manager; however, you can use Quatech's Device Manager to manage all the Quatech devices installed on your machine. Double click the Device Manager (DM) icon on your desktop to launch. Expand the Quatech Device Server group at the bottom. Select your Device Server and click Properties.

Four tabs display:

- General – information on device type, manufacturer, location, and device status
- Driver – information on drivers used including location and version
- Resources – COM port enumeration and first port number
- SDS Configuration – network information including MAS address, IP address, subnet mask, and default gateway

The SDS Configuration tab will be the most useful to you. You can differentiate between SDS units using the MAC address, which is equivalent to the serial number.

The Diagnostic Tools button runs a Ping test. Use the Web Interface button to bring up the Web interface. See Configuring the SDS using the Web interface on page 45 for details on using this interface.

Note: Remember, only use the Web interface to make changes to the SDS configuration.

Use the Advanced button to repair a broken connection. For instance, if the SDS' IP address changes and your DM can no longer find it, you can search for the SDS and note its changed IP address.

Win NT – Changing port numbers

Click on the first port to see its designated port number. You can use the DM to change the port numbers if necessary. Changing the first port causes the others to change sequentially. See page 45 for details.

Uninstalling your SDS

Uninstalling from Windows XP/2000

Follow these steps in the event that you need to uninstall or reinstall the SDS software on a Windows XP or 2000 system.

1. From the Control Panel, select System.
2. Click on the Hardware tab.
3. Click on Device Manager.
4. Expand Multi-port serial adapters and select your Quatech Device Server.
5. Right click and select Uninstall.
6. At the Confirmation screen, click OK.
7. Click Finish at the Completing the Add/Remove Hardware Wizard screen.

Uninstalling from Windows NT4

Follow these steps in the event that you need to uninstall the SDS on a Windows NT4 system.

1. Click on Quatech Device Manager.
2. Expand the SDS devices and select your Quatech Device Server.
3. Click Remove at the bottom of the screen.
4. If desired, use Add/Remove programs to remove the Device Manager.
5. Reboot your machine.

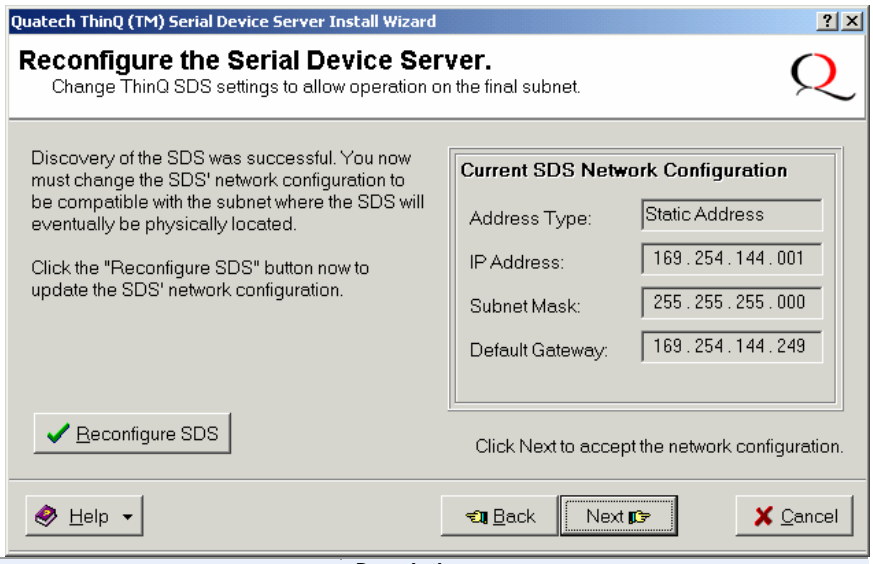
Alternative installation steps

Note: This section has steps that are used less frequently than those in the preceding section.

This section supplements the basic installation procedure by taking you through alternative installation scenarios. It then directs you to the appropriate step in the basic procedure.

Figure 25 shows the current configuration parameters for the SDS. You can accept these parameters by pressing Next or you can change them by pressing Reconfigure SDS.

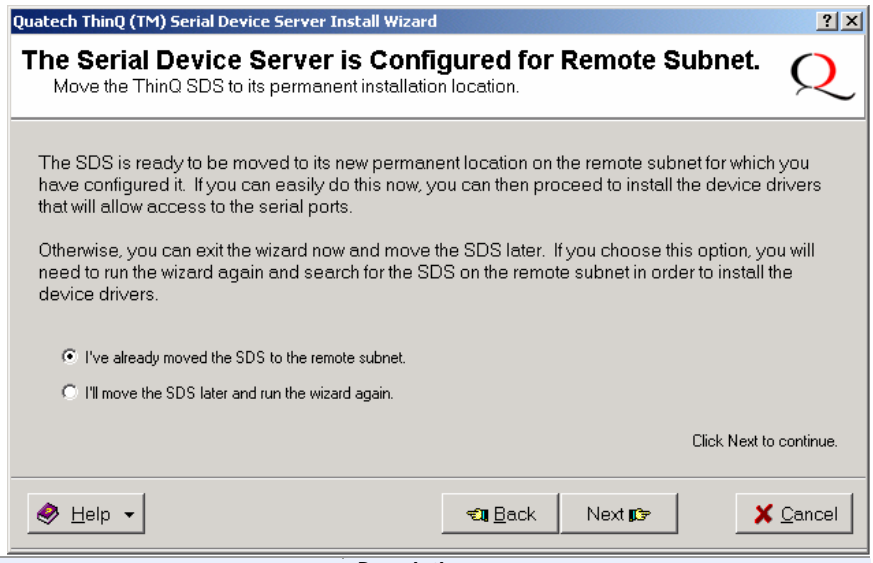
Figure 24 - Reconfigure the Serial Device Server screen



Step	Procedure	Description
☐ Step 30	The Reconfigure the Serial Device Server screen lets you change the SDS' configuration so that it can operate in its permanent location. ➢ If you do not need to change the configuration, press the Next button to continue. ➢ To change the configuration, click the Reconfigure SDS button.	*If your SDS is temporarily attached to your computer's NIC port, you may need to attach it to a different subnet when you do a permanent installation.* *The Serial Device Server is Configured for a Remote Subnet screen displays.* ***Continue with □ Step 31.*** *The Internet Protocol (TCP/IP) Properties dialog box displays.* **Go to □ Step 32.**

Figure 26 allows you either to move the SDS to its permanent subnet location and continue the installation or to exit the wizard and install the SDS at a later time.

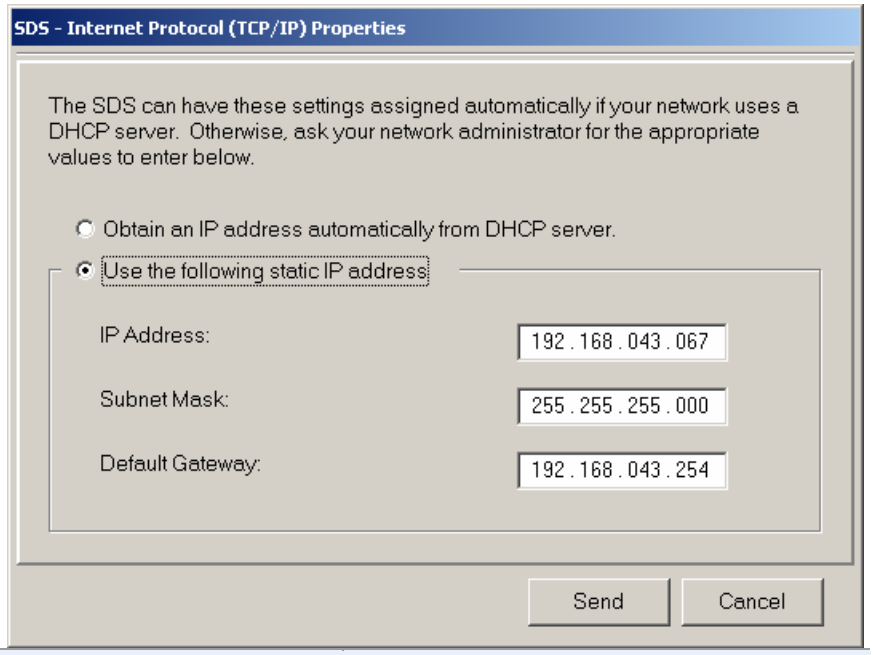
Figure 25 - Serial Device Server is Configured for a Remote Subnet



Step	Procedure	Description
☐ Step 31	Select one of the following options:	
	➢ *I've already moved the SDS to the remote subnet.* Press Next to continue.	*The Network Connectivity Test screen displays.* **Go to □ Step 14.**
	➢ *I'll move the SDS later and run the wizard again.* Press Next to continue.	*The Wizard closes and returns you to the desktop.*

Figure 26 - Internet Protocol (TCP/IP) Properties dialog box

Figure 27 shows the current configuration parameters for the SDS. You can change these parameters by keying in the desired values.



Step	Procedure	Description
☐ Step 32	The Internet Protocol (TCP/IP) Properties dialog box lets you change the SDS' configuration so that it can operate in its permanent location. Select one of the following options: ➢ *Use the following static IP address.* ➢ *Obtain an IP address automatically from the DHCP server.*	*If you are not sure of the configuration parameters, consult your system administrator.* *Note: We recommend that you use a static IP address to ensure reliable operation.* ***Continue with □ Step 33.*** **Go to □ Step 34.**
☐ Step 33	Key in any necessary changes to the: ➢ *IP address,* ➢ *Subnet mask, and* ➢ *Default gateway.*	*Your system administrator can provide you with specific parameters.*
☐ Step 34	Press Send to send your changes to the SDS.	*The Restart confirmation pop-up box displays.* ***Continue with □ Step 35.***

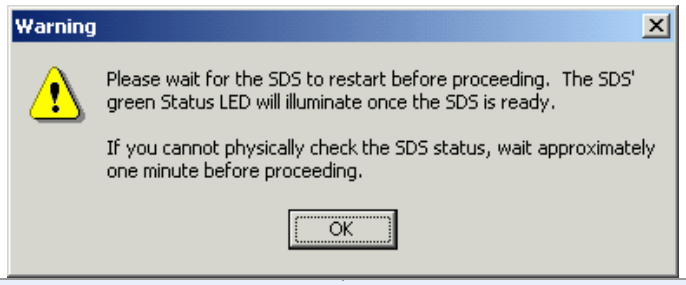
Figure 27 - Restart confirmation pop-up box

Figure 28 shows the Restart confirmation pop-up box.

Step	Procedure	Description
☐ Step 35	Press OK to restart the SDS and make your changes active.	*The SDS reboots and takes on the new configuration. The Information pop-up box displays.* ***Continue with □ Step 36.***

Figure 28 - Information pop-up box

Figure 29 warns you that the SDS needs time to reset. Wait until the status LED glows green before pressing OK.

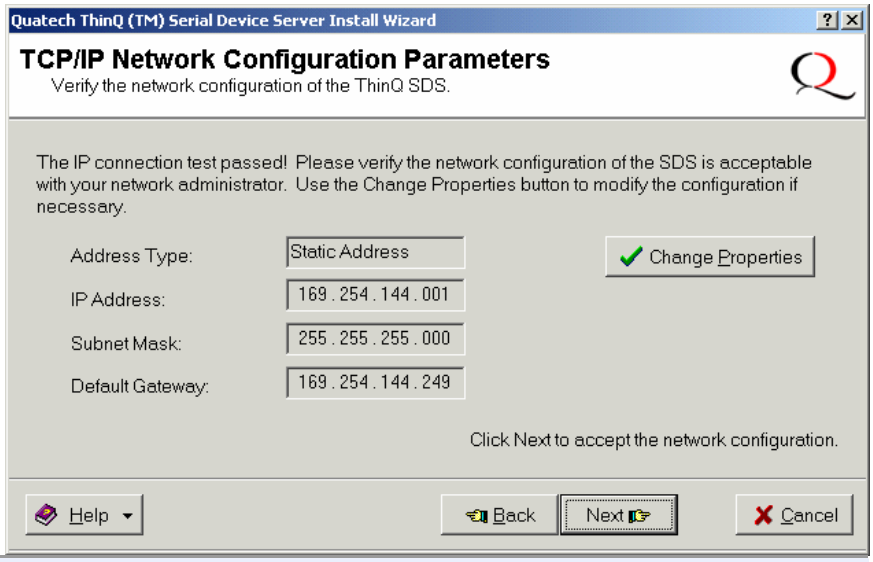


Step	Procedure	Description
☐ Step 36	When the Status light glows green, press OK.	*This indicates that the SDS is ready.* ***Continue with □ Step 37.***
☐ Step 37	Depending on your path to this step, one of three possible screens will display:	
	➢ *TCP/IP Network Configuration Parameters*	***Continue with □ Step 38.***
	➢ *Reconfigure the Serial Device Server*	**Go to □ Step 30.**
	➢ *SDS Wizard Information*	**Go to □ Step 41.**

Figure 29 - TCP/IP Network Configuration Parameters screen

Figure 30 shows the TCP/IP network configuration parameters including the following:

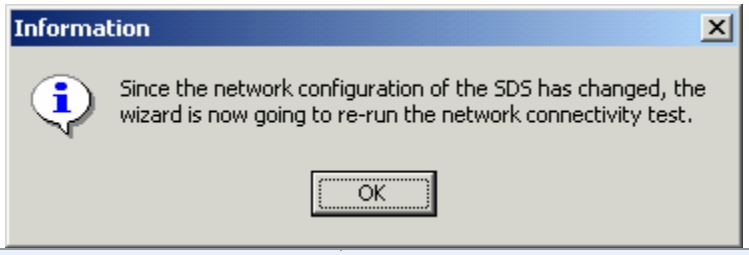
- Address type
- IP Address
- Subnet mask
- Default gateway



Step	Procedure	Description
☐ Step 38	If you are satisfied with the parameters, press Next to continue.	*The Rerun network connectivity test pop-up box displays.* ***Continue with □ Step 39.***
	If you are not satisfied, press Change Properties to change the TCP/IP properties.	*The Internet Protocol (TCP/IP) Properties dialog box displays.* **Go to □ Step 32.**

Figure 30 - Rerun network connectivity test pop-up box

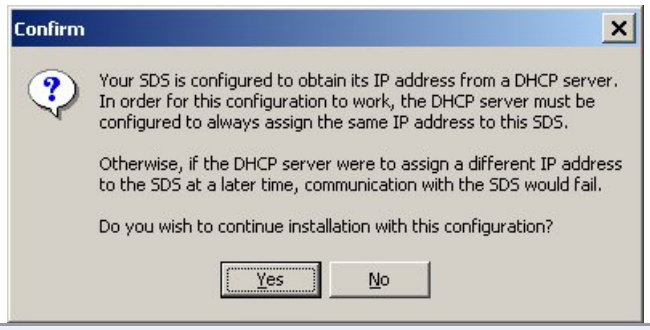
Figure 31 shows the Rerun network connectivity test pop-up box.



Step	Procedure	Description
☐ Step 39	Press OK.	*The Network Connectivity Test screen displays.* **Go to □ Step 14.**

Figure 31 - DHCP confirmation pop-up box

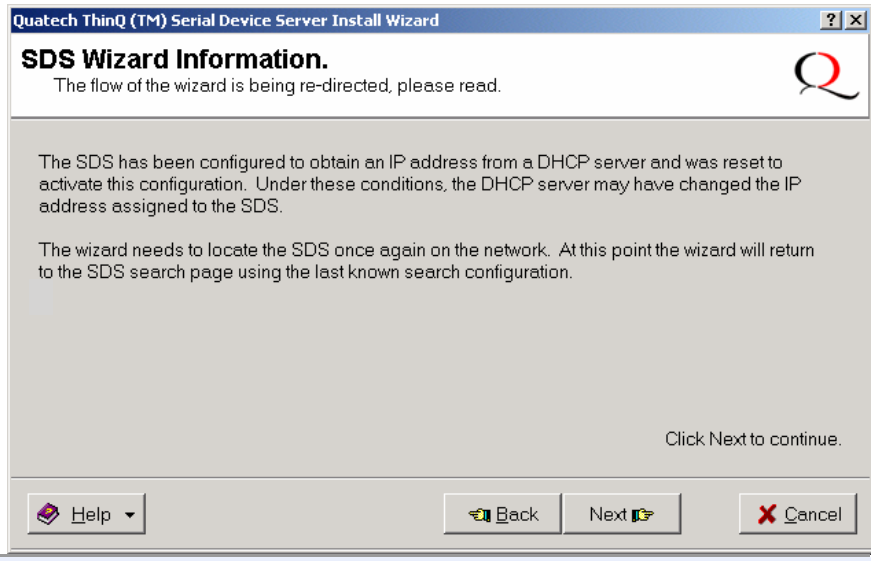
Figure 32 shows DHCP server confirmation pop-up box. Only answer Yes if you are sure that the DHCP server will always assign the same IP address to the SDS.



Step	Procedure	Description
☐ Step 40	Press Yes to have the DHCP server assign the IP address only if you are sure it will assign the same IP address each time.	*If you answer Yes, the DHCP server will assign the IP address for your SDS.* ***If this address changes, communication with the SDS may fail.*** *The SDS Wizard Information DHCP screen displays.* ***Continue with □ Step 41.***
	Otherwise, press No.	*If you answer No, you return to the TCP/IP Network Configuration Parameters screen.* **Go to □ Step 16.**

Figure 32 - SDS Wizard Information DHCP screen

Figure 33 informs you that the Wizard going to search for the SDS using the last known IP parameters.



Step	Procedure	Description
☐ Step 41	Press the Next button.	*The Search network for Serial Device Servers screen displays.* **Go to □ Step 10.**

Figure 33 - Locate the Serial Device Server screen

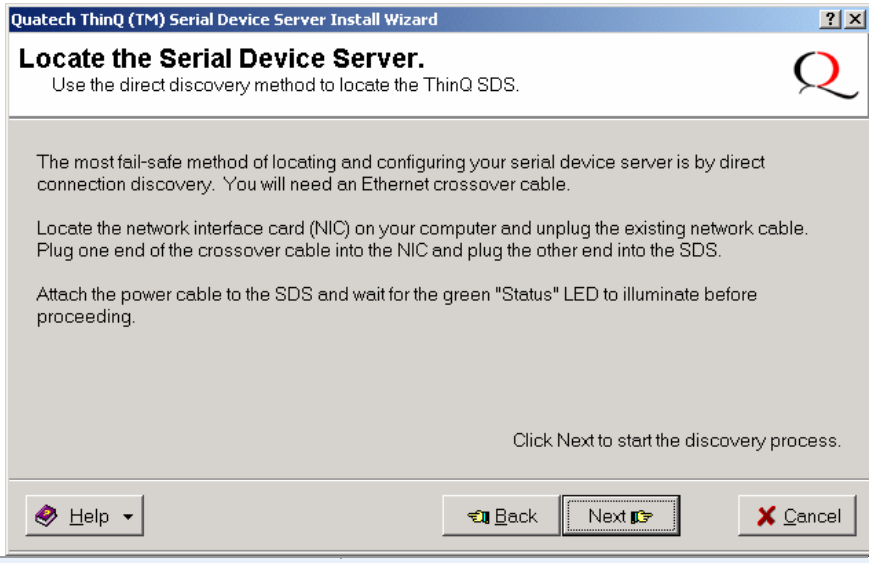
Figure 34 offers you three options to locate your new SDS:

- Find an SDS that is plugged directly into your computer's NIC.
- Find an SDS that is attached to a remote subnet.
- Select your SDS model from a list of all supported serial device servers.

Step	Procedure	Description
☐ Step 42	Select one of the following options:	
	➢ *Search for an SDS attached directly to my computer (Recommended).* Press Next to continue.	*The Locate the Serial Device Server using direct discovery screen displays.* ***Continue with □ Step 43.***
	➢ *Search for an SDS attached to a remote subnet.* Press Next to continue.	*The Locate the Serial Device Server on a remote subnet screen displays.* **Go to □ Step 45.**
	➢ *Manually select and install from a list of all supported serial device server models.* Press Next to continue.	*The Select Desired Serial Device Server from list screen displays.* **Go to □ Step 53.**

Figure 35 explains how to connect the SDS to your computer for location and configuration purposes.

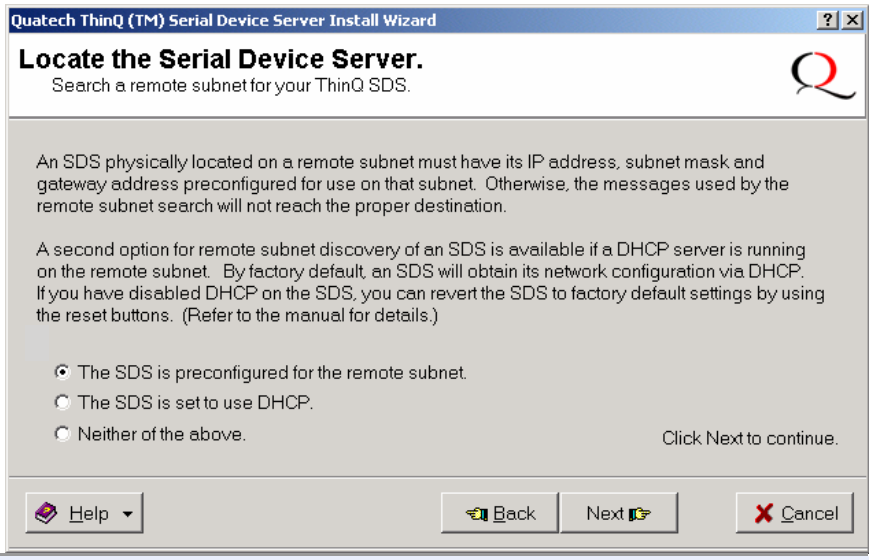
Figure 34 - Locate the Serial Device Server using direct discovery screen



Step	Procedure	Description
☐ Step 43	Connect the Ethernet port on your SDS to the Network Interface Connection (NIC) on your computer. Either a crossover patch cable or a "straight through" cable will work.	***Continue with □ Step 44.***
☐ Step 44	Connect power to the SDS and confirm that it is ready to proceed. Press Next to continue.	*The Status LED should glow green.* *The Search network for Serial Device Drivers screen displays.* **Go to □ Step 10.**

Figure 35 - Locate the Serial Device Server on a remote subnet screen

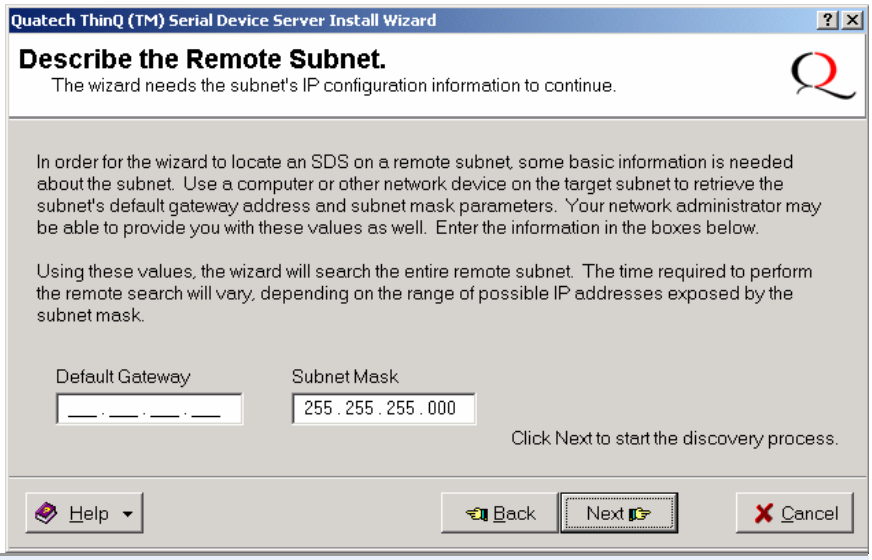
Figure 36 explains the options you have to search for an SDS on a remote subnet.



Step	Procedure	Description
☐ Step 45	Select one of the three following options:	
	➢ *The SDS is preconfigured for the remote subnet.* Press Next to continue.	*The Describe the Remote Subnet screen displays.* ***Continue with □ Step 46.***
	➢ *The SDS is set to use DHCP.* Press Next to continue.	*The Describe the Remote Subnet screen displays.* ***Continue with □ Step 46.***
	Note: If DHCP is disabled on the SDS, press the Reset button on the back to enable it.	
	➢ *Neither of the above.* Press Next to continue.	*The Locate the Serial Device Server screen displays.* **Go to □ Step 48.**

Figure 37 explains how to gather the information you need to search for your SDS on a remote subnet.

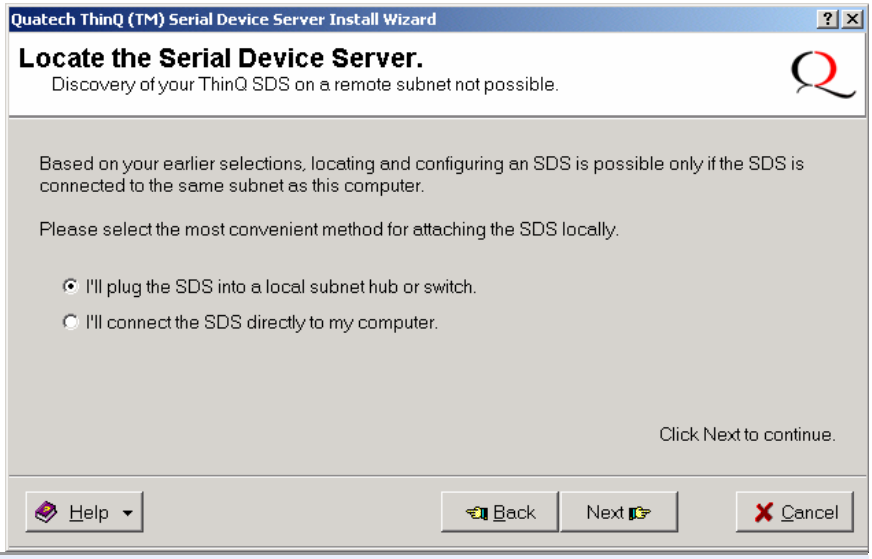
Figure 36 - Describe the Remote Subnet screen



Step	Procedure	Description
☐ Step 46	Locate the target subnet's default gateway address.	*You can get this address from a device already on the target subnet. Your system administrator should also be able to provide this information.*
☐ Step 47	Enter the target subnet's default gateway address in the space provided. Press Next to continue.	*The Wizard initiates a search of the specified target subnet.* *The Search network for Serial Device Servers screen displays.* **Go to ☐ Step 10.**

Figure 38 illustrates the Locate the Serial Device Server screen. You can either connect the SDS to a local hub or switch or you can connect it directly to your computer.

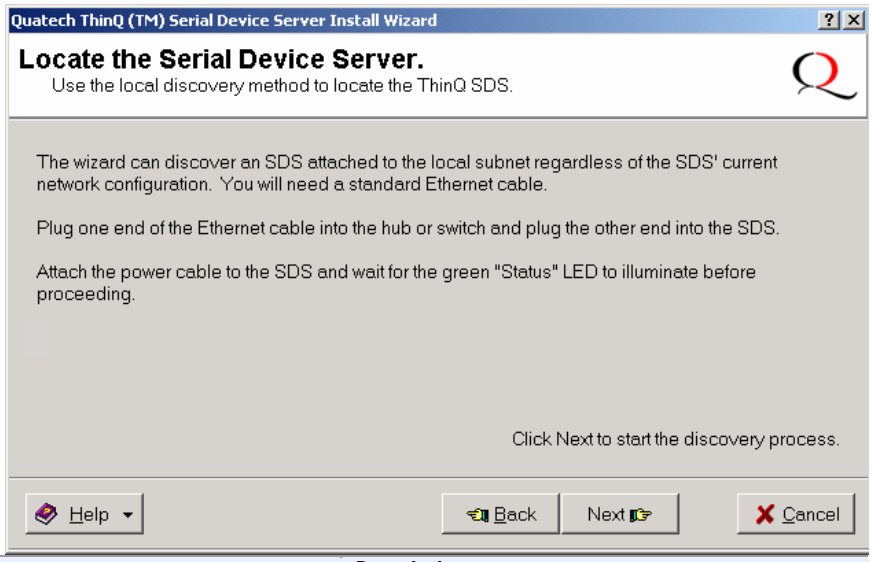
Figure 37 - Locate the Serial Device Server options screen



Step	Procedure	Description
☐ Step 48	Select one of two options:	
	➢ *I'll plug the SDS unit into a local subnet hub or switch.* Press Next to continue.	*The Locate the Serial Device Server local discovery screen displays.* ***Continue with □ Step 49.***
	➢ *I'll connect the SDS directly to my computer.* Press Next to continue.	*The Locate the Serial Device Server screen displays.* **Go to □ Step 43.**

Figure 38 - Locate the Serial Device Server local discovery screen

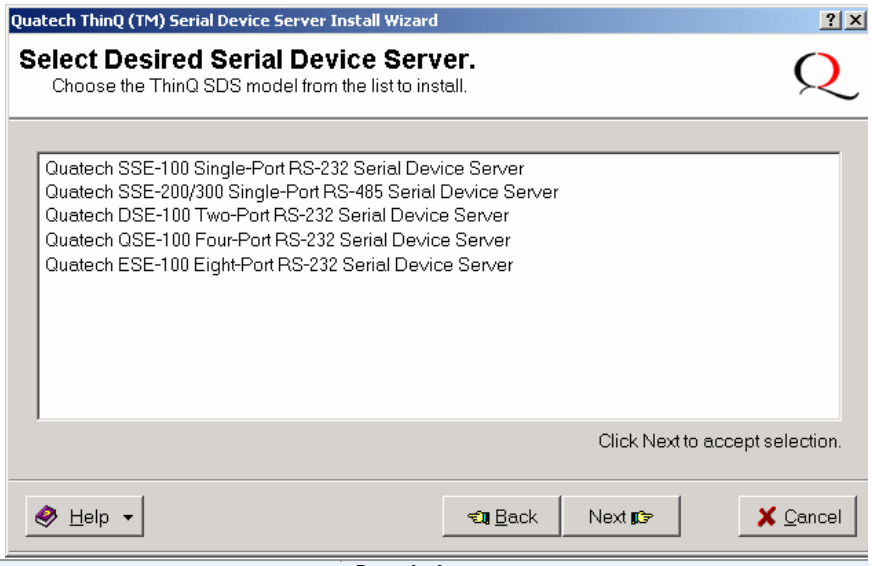
Figure 39 illustrates the Locate the Serial Device Server local discovery prompt.



Step	Procedure	Description
☐ Step 49	Connect the SDS to a local hub or switch.	*Use a standard Ethernet cable to connect the Ethernet port on the SDS to the hub or switch.* ***Continue with □ Step 50.***
☐ Step 50	Connect power to the SDS.	*Connect the cable attached to the power source to the SDS. Plug the connector of the unattached power cable into the power source's socket. Plug the other end of the cable into a power outlet. The SDS powers up.*
☐ Step 51	Confirm that the SDS is ready to proceed.	*The Status LED to the left of the power jack should glow green and the Power LED should glow blue.*
☐ Step 52	Click the Next button to continue.	*The Search network for Serial Device Servers screen displays and the Wizard searches the local subnet for active serial device servers.* **Go to □ Step 10.**

Figure 40 shows a complete list of all the Quatech serial device servers. This list will change as the SDS family grows.

Figure 39 - Select Desired Serial Device Server from list screen



Step	Procedure	Description
☐ Step 53	Locate and highlight your SDS device. Press the Next button to continue.	*This screen shows a complete list of all currently available Quatech device servers.* *The Specify IP Address screen displays.* ***Continue with □ Step 54.***

Figure 40 - Specify IP Address screen

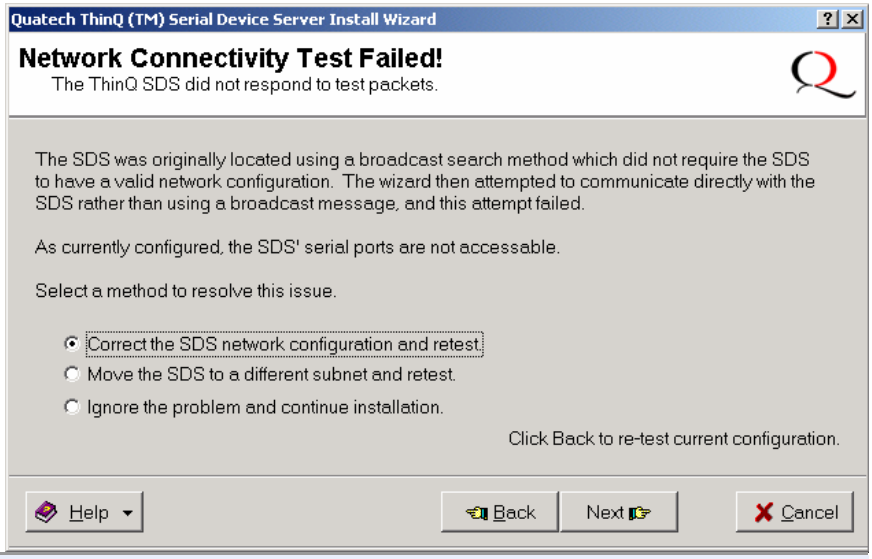
Figure 41 prompts you for the IP address of your SDS.

Step	Procedure	Description
☐ Step 54	Enter the IP address for your SDS in the box provided. Press the Next button to continue.	*If you are not sure of the IP address, see your system administrator.* *The Install the Device Drivers screen displays.* **Go to □ Step 27.**

Figure 41 - Network Connectivity Test Failed screen

Figure 42 displays when the IP connection test fails. It presents you with these three options:

- Change the SDS' IP configuration and retest
- Move the SDS to a different location and retest
- Ignore the problem and continue installing



Step	Procedure	Description
☐ Step 55	Select one of the following options:	*Click Back to retest current configuration.*
	➢ *Correct the SDS network configuration and retest.* Press Next to continue.	*If you are not sure of the configuration parameters, consult your system administrator. The Internet Protocol (TCP/IP) Properties dialog box displays.* **Go to □ Step 32.**
	➢ *Move the SDS to a different subnet and retest.* Press Next to continue.	*Check with your system administrator for the subnet address. The Locate the Serial Device Server on remote subnet screen displays.* **Go to □ Step 45.**
	➢ *Ignore the problem and continue installation.* Press Next to continue.	*The TCP/IP Network Configuration Parameters screen displays.* **Go to □ Step 16.**

Configuring the SDS using the Web interface

Note: Wi-Fi units must have their parameters configured before they can communicate wirelessly. See page 6 for Wi-Fi information and page 14 for configuration information.

Note: We have eliminated the need to use console ports, DOS shell commands, Telnet and other complicated methods of configuration. Just enter the IP address after the HTTP:// prefix in your Web browser's Address bar, click Go, and you are ready to reconfigure the Device Server remotely!

This section explains how to configure an SDS using a standard Web browser so that it can communicate over a network with a serial device.

After the installation program included on the SDS CD-ROM is finished, the Device Server will be ready for use as configured. If you wish to make changes to the configuration at a future time, it is a simple matter of entering the IP address of the Device Server into the address bar of your computer's Web browser.

Quatech recommends the use of Microsoft's Internet Explorer for accessing the Web browser-based configuration utilities built into our Device Servers. Other browsers can be used but be aware that we have not tested the many alternative browsers available, so some graphics and page formatting could be misaligned.

The SDS stores its configuration in nonvolatile memory (Flash), which is retained even when the unit is turned off.

Once you have installed the drivers on your computer and established an Ethernet connection with the SDS, you can maintain and configure the SDS using a Web interface.

Using a Web interface, you can:

- Configure the network settings (static vs. DHCP; if static, you can set the IP address, Gateway address, and Address mask)
- Configure Wi-Fi encryption settings
- View and set the serial port parameters (set per serial device application; setup lets you set data rate multiplier, performance mode, heartbeat timer, operating mode and operating mode settings)
- Perform diagnostic tests (Ping test, view port status list)
- Perform administrative functions (view, add, or remove users, give the SDS a descriptive name, upgrade software, and perform a remote reset)
- Contact Quatech corporate headquarters, sales, and technical support

Follow these steps to manage your SDS using a Web interface.

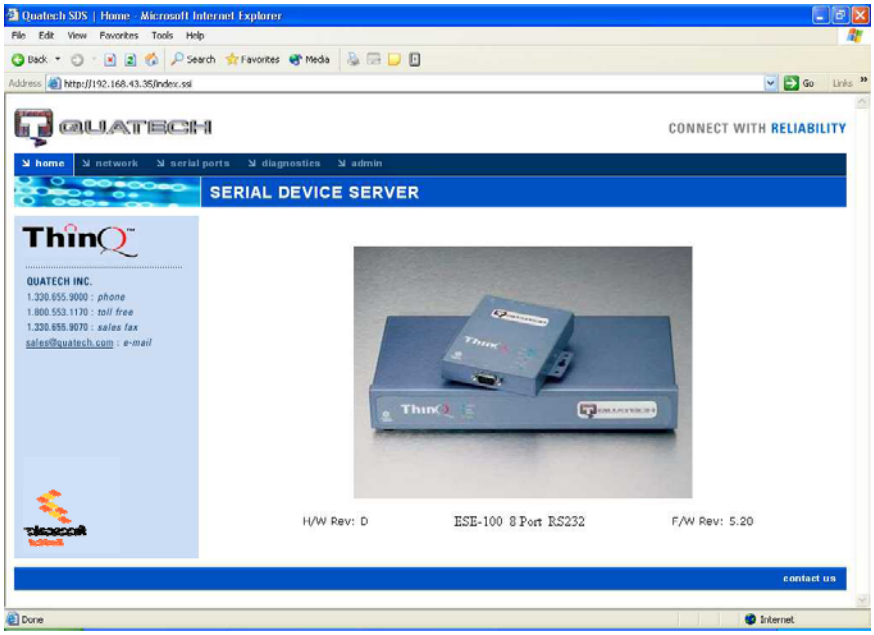
Step	Procedure	Description
❑ Step 1	Open your Web browser.	*We recommend Internet Explorer 5.0 or higher.*
❑ Step 2	Type the IP address for the SDS in the Web browser's URL (address) field.	*The format for an IP address is http:// followed by a series of numbers separated by periods, such as* http://123.456.789.123. *The Quatech Serial Device Server Home page displays.*

Figure 43 shows Quatech's Serial Device Server Home page. From this screen, you can:

- Access network settings
- Change serial port settings
- Run diagnostics
- Perform admin functions
- Contact Quatech

This screen shows you the hardware revision level, the SDS product description, and the software revision level.

Figure 42 - Home page screen



Setting network parameters

Note: If you inadvertently lose contact with the SDS, use the Installation Wizard to re-establish contact.

Note: To setup for a Wireless (Wi-Fi) SDS, you must first connect to it using the wired Ethernet mode. See Enabling Wi-Fi Device Servers on page 14 for details.

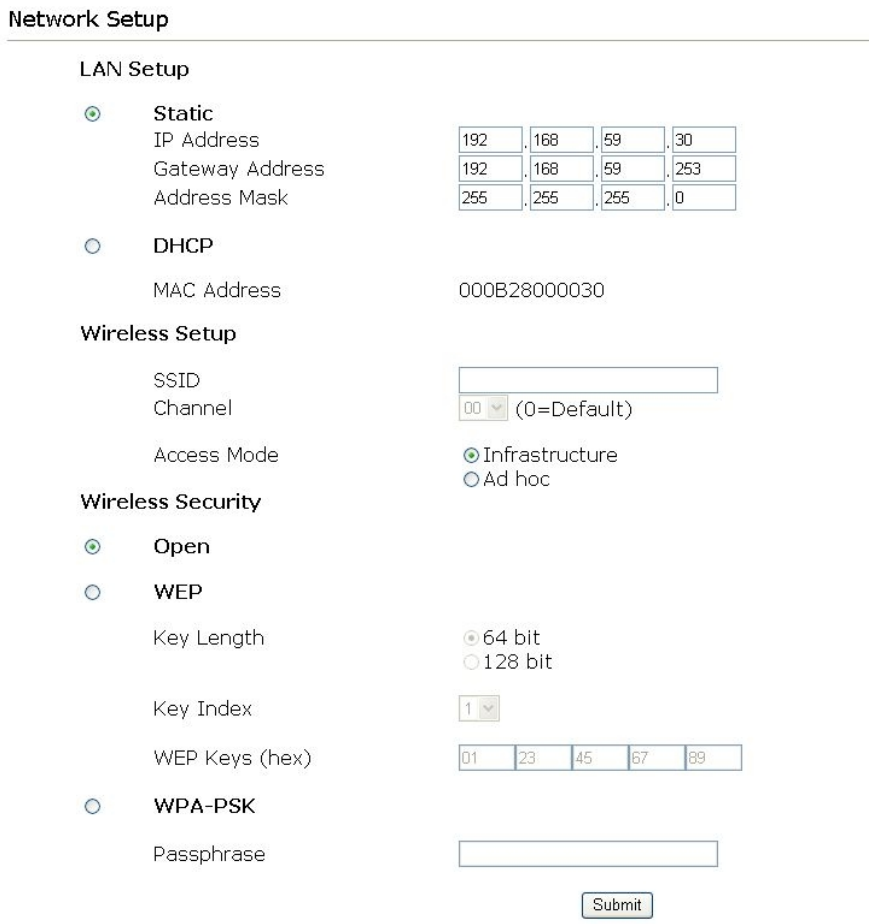
Once you have made the initial network connection, you can maintain and configure this connection using Quatech's Web interface. Of course, you can always go back and use the Installation Wizard to program the settings for the SDS. Contact your network administrator if you are unsure of any of these settings.

See Setting TCP/IP (LAN) and Wi-Fi (Wireless) parameters below or see Setting SNMP parameters on page 52.

Setting TCP/IP (LAN) and Wi-Fi (Wireless) parameters

Step	Procedure	Description
❑ Preliminary Step	Click on Network in the selection bar.	*The Network Setup screen shown on the following page displays.*

Figure 43 - Network Setup screen



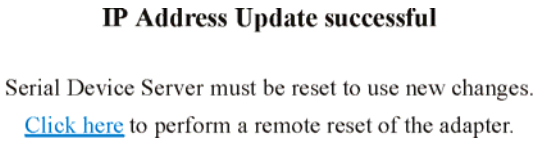
Step	Procedure	Description
❑ Step 1	Select between a Static IP address and one set by the DHCP server. For Static only, set the IP address.	*This must be a unique address in your network. Only let the DHCP server set the IP address if it is configured to always assign the same address to the SDS; otherwise, the connection will fail.* *Note that the SDS' MAC address is displayed. The MAC address is an Ethernet serial number.*
❑ Step 2	For Static only, set the Gateway IP address.	*The Gateway address must be within your local network. It should be the same as the IP address for the router that is connected to the same LAN segment as the SDS.*

Step	Procedure	Description
❑ Step 3	For Static only, set the Address mask.	*The Address mask is a string of 0's and 1's that screens out the network part of an IP address so that only the host computer part remains. Most people select the Class C Address mask.* ➢ Class A: 24 bits ➢ Class B: 16 bits ➢ Class C: 8 bits **Table 8 - Class A, B, and C address masks** Class / Host bits visible / Address mask A / 24 / 255.0.0.0 B / 16 / 255.255.0.0 C / 8 / 255.255.255.0 **Table 9 - Complete list of address masks** Address mask / Host bits 255.255.255.252 / 2 255.255.255.248 / 3 255.255.255.240 / 4 255.255.255.224 / 5 255.255.255.192 / 6 255.255.255.128 / 7 255.255.255.0 / 8 255.255.254.0 / 9 255.255.252.0 / 10 255.255.248.0 / 11 255.255.240.0 / 12 … / … 255.255.0.0 / 16 255.254.0.0 / 17 … / … 255.128.0.0 / 23 255.0.0.0 / 24
❑ Step 4	For Wired Setup, go to □ Step 11. For Wireless Setup, continue with □ Step 5.	*Before the SDS can communicate on an 802.11b wireless network, the WLAN settings must match the wireless network. By default, the SDS is set to Infrastructure network mode and its SSID, which is its wireless Network Name, is blank. This allows it to connect to any available wireless network.*

Step	Procedure	Description
❑ Step 5	Configure the SSID (network name).	*The Service Set Identifier (SSID) is the name assigned to your wireless network. All devices on a wireless network must be configured with the same SSID.*
❑ Step 6	Select the Access Mode. ➢ *Infrastructure (using the access point)* If using Infrastructure mode, go to □ Step 8. ➢ *Ad hoc (no access point)* If using Ad hoc mode, continue with □ Step 7.	*In Infrastructure mode, an AP bridges or joins a wireless network (WLAN) to a wired Ethernet network (LAN).* *Ad hoc is a wireless communication mode that allows all wireless devices within range of each other to discover and communicate with one another without involving central access points.* *Devices communicating in ad hoc mode do so in peer-to-peer fashion. All wireless adapters on the ad-hoc network must use the same SSID and the same channel number.*
❑ Step 7	For Ad hoc only, configure the Channel.	*As with the SSID, devices sharing a wireless link must be tuned to the same channel.* *Note: The Channel setting is only used in Ad hoc mode. In Infrastructure mode, the access point (AP) determines which channel all devices associated with it must use.*
❑ Step 8	Select the wireless security (encryption) mode. ➢ *Open. Continue with* □ Step 12. ➢ *WEP. Continue with* □ Step 10. ➢ *WPA-PSK. Continue with* □ Step 9.	*Note: In Infrastructure mode, the access point (AP) determines which setting must be used. In Ad hoc mode, all of the wireless devices on the ad hoc network must use the same setting.* *Open mode disables encryption.* *WEP provides basic encryption supported by nearly all 802.11 access points.* *WPA-PSK is more robust than WEP. It is supported by many recently designed access points.*
❑ Step 9	Enter the WPA-PSK Passphrase. Go to □ Step 12.	*The passphrase can be as long as 63 characters. The same passphrase must be used on the access point and on the SDS.*
❑ Step 10	Select the WEP Key Length. ➢ *64 bit* ➢ *128 bit*	*Sets the WEP key length to be used.* *Selecting 64 bit activates the top row of hex number boxes.* *Selecting 128 bit activates both rows.*

❑ Step 11	Enter the WEP Keys in hex.	*These are two digit hex values that will be used for the WEP keys. Valid characters are 0-9, a, b, c, d, e, and f.*
❑ Step 12	Press Submit to configure the SDS with your settings. *Note: Press the browser's Back button to make no changes to the original settings.*	*The IP Address Update successful screen displays. You must reset the SDS for your changes to take effect.* *If you press the browser's Back button, your original settings remain unchanged.*

Figure 44 - IP Address Successful screen

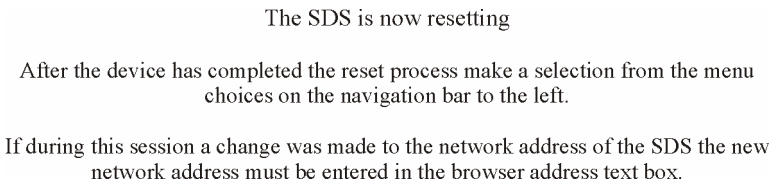


Step	Procedure	Description
❑ Step 13	Click on the link to reset the SDS.	*The Remote Reset screen displays.*

Figure 45 - Remote Reset screen

Step	Procedure	Description
❑ Step 14	Press Reset to activate your settings.	*The SDS is now resetting screen displays.*

Figure 46 - SDS is now resetting screen



Step	Procedure	Description
❑ Step 15	Close and reopen the browser. ➢ *Enter the new IP address in the URL address block.*	*This confirms that the SDS is accessible.*

Setting SNMP parameters

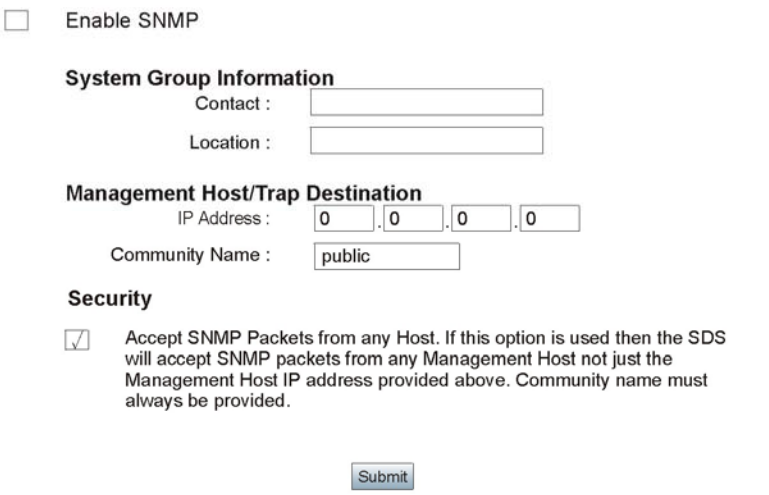
Note: Only SDS devices with a firmware revision level of 5.0 and above can support SNMP.

SDS devices with firmware revision 5.0 and higher have been enhanced with additional Flash RAM to support SNMP. Older hardware does not have sufficient memory to store the SNMP agent.

To determine the firmware revision level of an SDS, navigate to the Home page in the Web-based interface (see page 45). The F/W revision level is shown at the bottom of the Home page.

Step	Procedure	Description
❑ Preliminary Step	Click on Network in the selection bar and then select SNMP Setup from the left panel.	*The SNMP Setup screen shown on the following page displays.*

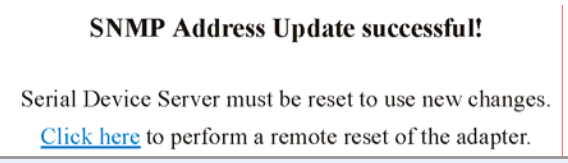
Figure 47 - SNMP Setup screen



Step	Procedure	Description
❑ Step 1	Enable or disable SNMP in the SDS. ➢ *Select the Enable SNMP checkbox to enable SNMP. Continue with* □ Step 2. ➢ *Clear the checkbox to disable SNMP. Go to* □ Step 5.	*By default, SNMP is disabled and the checkbox is cleared.*
❑ Step 2	Enter the System Group information. ➢ *Contact:* ➢ *Location:*	*The Contact should be the person responsible for the operation of the SDS.* *The Location could be as general as Italy or as specific as the 3rd floor storage closet.* *Note: The System Group Description is the same as the SDS Descriptive Name, which you can set on the Administration screen.*
❑ Step 3	Enter the Management Host/Trap	

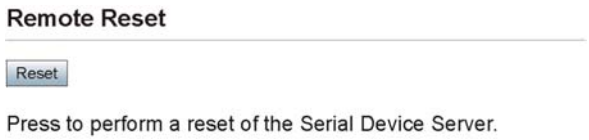
Step	Procedure	Description
	Destination information. ➢ *IP Address:* ➢ *Community Name:*	*The host IP address you set here is where the SDS will send its traps.* *A community name, which is similar to a password, must always be provided. To receive traps from an SDS, the host must have the same community name.* *Note: If you set a host address of 0.0.0.0, then you must disable Security. The SDS will not send any traps.*
❑ Step 4	Enable or disable Security. ➢ *Check to allow the SDS to accept SNMP packets from any host in the same community group.* ➢ *Clear the check box to allow the SDS to accept packets only from the host you specify in the Management Host / Trap Destination configuration.*	*By default, the SDS can accept SNMP packets from any host with the same community name.*
❑ Step 5	Press Submit to configure the SDS with your settings.	*The SNMP Update Successful screen displays. You must reset the SDS for your changes to take effect.* *If you press the browser's Back button, your original settings remain unchanged.* *Note: Press the browser's Back button to make no changes to the original settings.*

Figure 48 - SNMP Address Update Successful screen



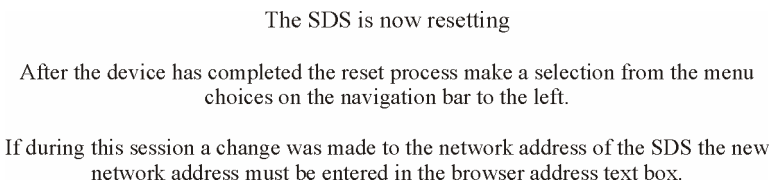
Step	Procedure	Description
❑ Step 6	Click on the link to reset the SDS.	*The Remote Reset screen displays.*

Figure 49 - Remote Reset screen



Step	Procedure	Description
❑ Step 7	Press Reset to activate your settings.	*The SDS is now resetting screen displays.*

Figure 50 - SDS is now resetting screen



Viewing the serial port parameters

Step	Procedure	Description
❑ Preliminary Step	Select Serial Ports from the selection bar and then select Serial Port Status from the left panel.	*The Serial Port Status screen shown on the following page displays.* *Note: You cannot make any changes to port parameters from this screen. To adjust these settings, select the Setup link.* ➢ ***In Use*** *indicates whether the port has been opened by a serial port application and so cannot be opened by another user application.* *If the port is open, In Use further indicates whether the port is open in Normal, Tunneling, Raw TCP, Auto TCP, or Raw UDP mode.*

Figure 51 - Serial Port Status screen

Serial Port Status

Port	Baud	Data Bits	Parity	Stop Bits	Flow	In Use
1	921600	8	None	1	None	Tunnel
2	38400	8	None	1	None	No

Setting serial port parameters

In configuring your Serial Device Server's serial port parameters, there are two main considerations:

- Which operating mode should you use?
- Is your serial port connection RS-232, RS-422 or RS-485?

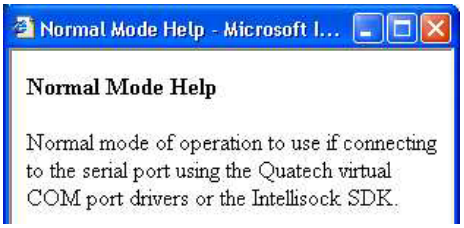
Setting Normal operating mode parameters

This section explains how to set your RS-232 and RS-422/485 parameters and also provides details on setting up your SDS in the Normal operating mode. In the following sections, you'll find information on configuring your SDS for Tunneling, Raw TCP, Auto TCP, and Raw UDP operating modes.

Note: Normal is the standard connection mode for an SDS.

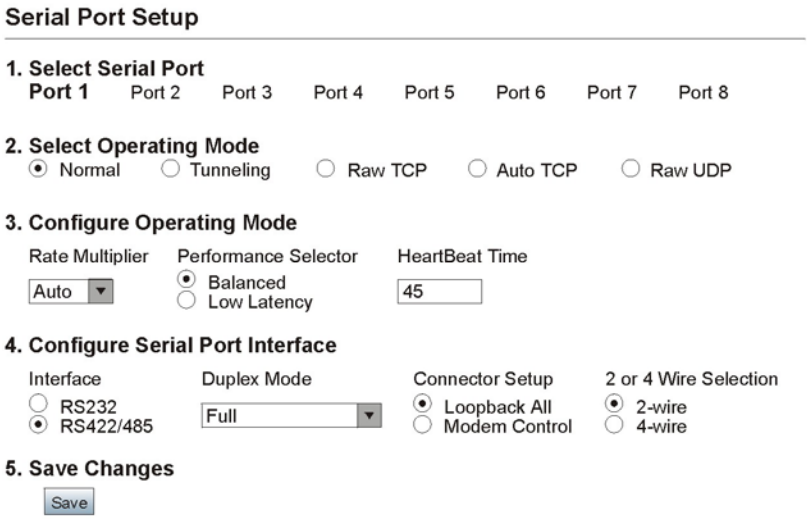
In most cases, you will use the Normal operating mode for your SDS. This allows you to use either Quatech's virtual COM port drivers or the IntelliSock SDK to communicate over a network.

Step	Procedure	Description
❑ Preliminary Step	Click on Serial Ports in the selection bar.	*The Serial Port Setup screen shown on the following page displays.*

Step	Procedure	Description
	Note: Setup screens vary slightly between RS-232 and RS-232/422/485 (MEI) units. *If you have an RS-232/422/485 (MEI) SDS, the Configure Serial Port Interface step will display so that you can select between RS-232 and RS-422/485 operation.* *If you have an RS-232 SDS, the Configure Serial Port Interface step will not display and you will not be presented with any RS-422/485 configuration options.*	*Note: Click on a link to see a pop-up help screen for that item. For example, if you click on the Normal Mode link, the following help screen pops up.* 

Note: Click on a link to see a pop-up help screen for that item.

Figure 52 - Serial Port Setup screen for Normal mode



Step	Procedure	Description
❑ Step 1	Click on the serial port you want to configure.	*Clicking on a port number highlights and selects that port. The selections on the screen are automatically populated with the parameters for the selected port.*
❑ Step 2	Click on the Normal Operating Mode selector.	*Select* Normal mode *if you are using the Quatech virtual COM port drivers or IntelliSock SDK.* *You will find directions for configuring ports in Tunneling, Raw TCP, Auto TCP, and Raw UDP modes in the following sections.*
❑ Step 3a	Configure the Operating mode. Click on the desired data Rate Multiplier. Your choices are: ➢ *Auto (Recommended)* ➢ *Force X2 mode*	*The auto setting has no effect on the baud rate you set. However, if you select X2, X4, or X8, the baud rate of the serial port will be the baud rate that you set multiplied by 2, 4, or 8, respectively.*

Step	Procedure	Description
	➢ *Force X4 mode* ➢ *Force X8 mode*	*Note: Forcing a change in the data rate may cause communication problems with some serial devices. If this is the case, change the setting back to Auto (Recommended).*
❑ Step 3b	Click on the desired Performance Selector.	*Choose balanced mode except in those cases where the serial device cannot tolerate the slight delays inherent in normal TCP/IP operation.* Balanced mode *offers excellent performance for most applications.* Low Latency *mode heavily favors responsiveness over throughput.*
❑ Step 3c	Set the Heart Beat Time to a value from 1 to 65534 seconds. Default is 45 seconds. *Note: Use a value of 0 to disable the heartbeat timer.*	*Heartbeat messages help detect when a connection has been lost between the PC driver and the SDS.* *If you need quick notification that the connection has been lost, set this timer to a shorter value.* *If you are more concerned about network traffic, set this timer to a longer value.*
	Steps 4a through 4d apply only to RS-232/422/485 (MEI) units	
❑ Step 4a (MEI only)	Configure the serial port interface. Click on the desired interface selector.	*This series of steps only applies to MEI units, such as the SSE-400.* *If you select RS232, the RS422/485 selections will be grayed out. Continue with* □ Step 5.
❑ Step 4b (MEI only)	Click on the desired duplex mode selector.	*Select* Full Duplex *to always enable transmit and receive drivers.* *Select* Half Rx *to only enable the transmit drivers when the SDS is transmitting; receivers will always be enabled.* *Select* Half Rx Tog *to disable receivers and enable the transmit drivers only when the SDS is transmitting.*
❑ Step 4c (MEI only)	Click on the desired connector setup.	*Select* Loopback All *to internally loopback RTS and CTS in the SDS. AuxIn and AuxOut are looped at the connector.* *Select* Modem Control *to send RTS on the AuxOut signal and to receive CTS on the AuxIn signal.*
❑ Step 4d (MEI only)	Select 2- or 4-wire communication.	*Select* 2-wire *to use the transmit pair for both transmit and receive in RS-422/485.* *Select* 4-wire *to use a separate pair of wires for transmit and receive in RS-422/485.*

Step	Procedure	Description
	Step 4 (non-MEI) / Step 5 (MEI) applies to all units	
❑ Step 4 (non-MEI) or ❑ Step 5 (MEI only)	Repeat the steps above for each port you need to configure and then press Save to implement all of your changes.	*Close and re-open the port to activate your changes.* *That's it! You're done. Normal is the most common operating mode and the easiest to set up.*

Setting Tunneling operating mode parameters

Note: In Tunneling, a master configures a slave so that the slave can communicate with it.

Note: A Tunnel master needs to know the slave's IP address and serial port number.

Serial Tunneling allows two SDS units to create a virtual cable connection between each other's serial ports with one end configured as a master and the other end as a slave. You set up the master with the slave's IP address and serial port number that you want use for the virtual connection. The master finds the slave and makes the connection. The master configures the slave's parameters (baud rate, parity, and so forth) as necessary. A master can connect either to an SDS in Normal mode or to a slave in Tunneling mode.

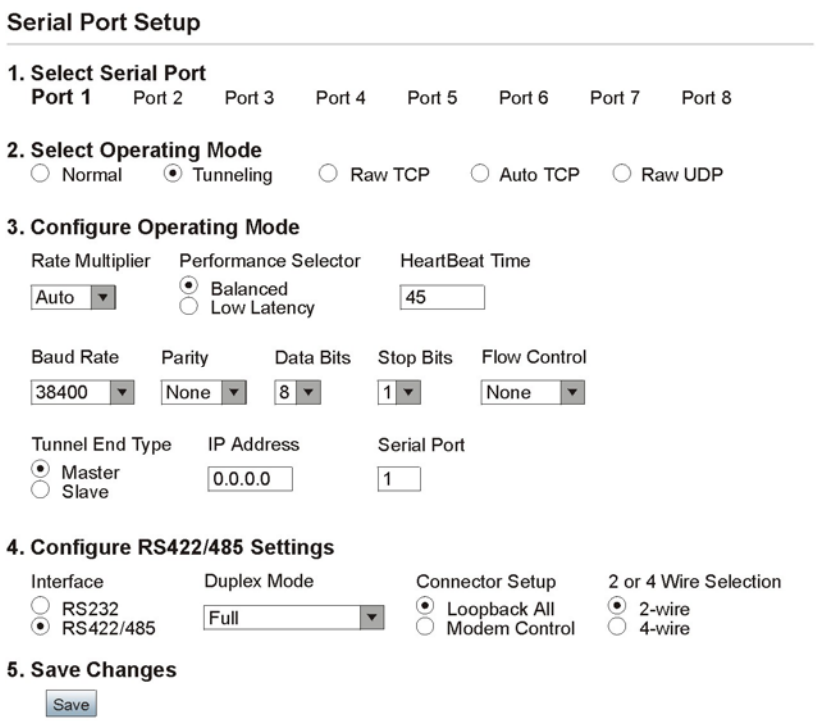
On the slave end, all you have to do is click Slave and leave the rest of the Operating Mode settings blank. The slave waits for a master to connect to it and to provide the configuration parameters.

A master connects to one of a slave's serial ports. A second master can connect to another port on the slave at the same time. However, you can only have one Tunnel master/slave combination working at the same time between any single set of ports.

Step	Procedure	Description
❑ Preliminary Step	Select Serial Ports from the selection bar.	*The Serial Port Setup screen shown on the following page displays.*
		Note: Click on a link to see a pop-up help screen for that item. For example, if you click on the Tunnel Slave link, the following help screen pops up.
	Note: Setup screens vary slightly between RS-232 and RS-232/422/485 (MEI) units. *If you have an RS-232/422/485 (MEI) SDS, the Configure Serial Port Interface step will display so that you can select between RS-232 and RS-422/485 operation.* *If you have an RS-232 SDS, the Configure Serial Port Interface step will not display and you will not be presented with any RS-422/485 configuration options.*	

Note: Click on a link to see a pop-up help screen for that item.

Figure 53 - Serial Port Setup screen for Tunneling mode



Step	Procedure	Description
❑ Step 1	Select the serial port you want to configure.	*Click on a port number to select that port. The selections on the screen are automatically populated with any existing parameters for the selected port.*
❑ Step 2	Click on the Tunneling Operating Mode selector.	*Tunneling allows two SDS devices to create a virtual connection between their serial ports.* *You will find directions for configuring ports in Normal mode in the previous section. Directions for Raw TCP, Auto TCP and Raw UDP modes are in the following sections.*
❑ Step 3a	Configure the Operating mode. Click on the desired data Rate Multiplier. Your choices are: ➢ *Auto (Recommended)* ➢ *Force X2 mode* ➢ *Force X4 mode* ➢ *Force X8 mode*	*The auto setting has no effect on the baud rate you set. However, if you select X2, X4, or X8, the baud rate of the serial port will be the baud rate that you set multiplied by 2, 4, or 8, respectively.* *Note: Forcing a change in the data rate may cause communication problems with some serial devices. If this is the case, change the setting back to Auto (Recommended).*
❑ Step 3b	Click on the desired Performance Selector.	*Choose balanced mode except in those cases where the serial device cannot tolerate the slight delays inherent in normal TCP/IP operation.*

Step	Procedure	Description
		Balanced mode *offers excellent performance for most applications.* Low Latency mode *heavily favors responsiveness over throughput.*
❑ Step 3c	Set the Heart Beat Time to a value from 1 to 65534 seconds. Default is 45 seconds. *Note: Use a value of 0 to disable the heartbeat timer.*	*Heartbeat messages help detect when a connection has been lost between the PC driver and the SDS.* *If you need quick notification that the connection has been lost, set this timer to a shorter value.* *If you are more concerned about network traffic, set this timer to a longer value.*
❑ Step 3d	Click on the desired Tunnel End Type selector. If Slave, skip to Step 4. If Master, continue with Steps 3e–3k. *Note: Steps 3e–3k are only available if the Tunnel End Type is set to Master. If it is set to Slave, they are grayed out.*	*This selection determines which end of the serial tunnel connection is the Master and which is the Slave. At this point, your Slave ports are completely configured. Master ports must have the following parameters set.*
❑ Step 3e	Set the Baud Rate.	*The SDS and the serial device(s) to which it is attached must use the same serial connection speed.*
❑ Step 3f	Set the Parity.	*Parity can be odd, even, or none.*
❑ Step 3g	Set the Data Bits.	*Data Bits can be 7 or 8.*
❑ Step 3h	Set the Stop Bits.	*Stop Bits can be 1 or 2.*
❑ Step 3i	Set the Flow Control.	*Flow control determines the handshake method used between the SDS and the serial device(s) to stop the serial input/output process*
❑ Step 3j	Set the IP Address of the Slave SDS.	*This selection sets the IP address to be used in Serial Tunneling mode.*
❑ Step 3k	Set the Serial/TCP Port number on the Slave SDS.	*This selection sets the serial port for Serial Tunneling mode. For a single-port Slave SDS, enter "1"; for a multi-port Slave SDS, enter the port number according to the label next to the connector you plan to use.*
	Steps 4a through 4d apply only to RS-232/422/485 (MEI) units	
❑ Step 4a (MEI only)	Configure the serial port interface. Click on the desired interface selector.	*This series of steps only applies to MEI units, such as the SSE-400.* *If you select RS232, the RS422/485 selections will be grayed out. Continue with* □ Step 5.

Step	Procedure	Description
❑ Step 4b (MEI only)	Click on the desired duplex mode selector.	*Select* Full Duplex *to always enable transmit and receive drivers.* *Select* Half Rx *to enable the transmit drivers only when the SDS is transmitting; receivers are always enabled.* *Select* Half Rx Tog *to enable the transmit drivers and to disable receivers when the SDS is transmitting.*
❑ Step 4c (MEI only)	Click on the desired connector setup.	*Select* Loopback All *to internally loopback RTS and CTS in the SDS. AuxIn and AuxOut are looped at the connector.* *Select* Modem Control *to send RTS on the AuxOut signal and to receive CTS on the AuxIn signal.*
❑ Step 4d (MEI only)	Select 2- or 4-wire communication.	*Select* 2-wire *to use the transmit pair for both transmit and receive in RS-422/485.* *Select* 4-wire *to use a separate pair of wires for transmit and receive in RS-422/485.*
Step 4 (non-MEI) / Step 5 (MEI) applies to all units		
❑ Step 4 (non-MEI) or ❑ Step 5 (MEI only)	Repeat the steps above for each port you need to configure and then press Save to implement all of your changes.	*Close and re-open the port to activate your changes.* *That's it! You're done. Your SDS is configured for the Tunneling operating mode.*

Setting Raw TCP operating mode parameters

Note: You could use Raw TCP if you were running a simple, custom TCP application.

Raw TCP mode allows an application to communicate with an SDS without any custom protocol overhead. In this mode, the only data sent over the TCP connection is that which will be sent or received over the serial port.

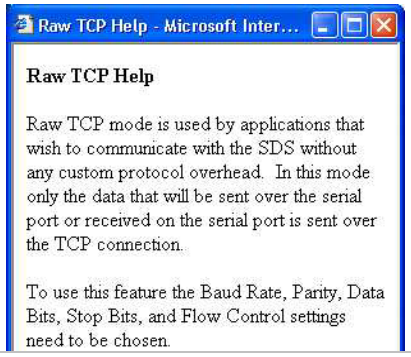
An SDS port in Raw TCP mode cannot connect to an SDS port in Normal mode because our Normal virtual COM port wraps the data in headers before it transmits. In Raw TCP mode, you can't send down a packet that says change the baud rate; you have to set up the serial port configuration yourself.

Note: Raw TCP settings must include the baud rate, parity, data bits, stop bits, and flow control.

Raw TCP lets you write your own simple program to communicate without having to put headers on the packet (no custom protocol overhead).

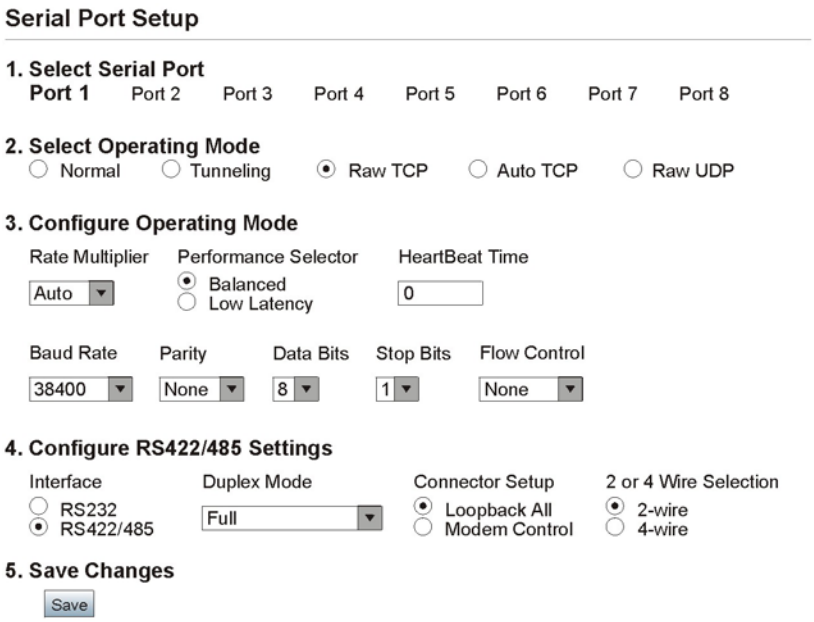
Step	Procedure	Description
❑ Preliminary Step	Select Serial Ports from the selection bar. *Note: Setup screens vary slightly between RS-232 and RS-232/422/485 (MEI) units. If you have an RS-232/422/485 (MEI) SDS, the Configure Serial Port Interface step will display so that you can select between RS-232 and RS-422/485 operation.*	*The Serial Port Setup screen shown on the following page displays.* *Note: Click on a link to see a pop-up help screen for that item. For example, if you click on the Raw TCP mode link, the following help screen pops up.*

If you have an RS-232 SDS, the Configure Serial Port Interface step will not display and you will not be presented with any RS-422/485 configuration options.



Note: Click on a link to see a pop-up help screen for that item.

Figure 54 - Serial Port Setup screen for Raw TCP mode



Step	Procedure	Description
❑ Step 1	Select the serial port you want to configure.	*Click on a port number to select that port. The selections on the screen are automatically populated with any existing parameters for the selected port.*
❑ Step 2	Click on the Raw TCP operating mode selector.	*Raw TCP allows an SDS device to communicate without any protocol overhead.* *You will find directions for configuring ports in Normal and Tunneling modes in the preceding sections. Directions for Auto TCP and Raw UDP modes are in the following section.*
❑ Step 3a	Configure the Operating mode. Click on the desired data Rate Multiplier. Your choices are: ➢ *Auto (Recommended)*	*The auto setting has no effect on the baud rate you set. However, if you select X2, X4, or X8, the baud rate of the serial port will be the baud rate that you set multiplied by 2, 4, or 8, respectively.*

Step	Procedure	Description
	➢ *Force X2 mode* ➢ *Force X4 mode* ➢ *Force X8 mode*	*Note: Forcing a change in the data rate may cause communication problems with some serial devices. If this is the case, change the setting back to Auto (Recommended).*
❑ Step 3b	Click on the desired Performance Selector.	*Choose balanced mode except in those cases where the serial device cannot tolerate the slight delays inherent in normal TCP/IP operation.* Balanced mode *offers excellent performance for most applications.* Low Latency mode *heavily favors responsiveness over throughput.*
❑ Step 3c	Set the Heart Beat Time to a value from 1 to 65534 seconds. Default is 45 seconds. *Note: Use a value of 0 to disable the heartbeat timer.*	*Heartbeat messages help detect when a connection has been lost between the PC driver and the SDS.* *If you need quick notification that the connection has been lost, set this timer to a shorter value.* *If you are more concerned about network traffic, set this timer to a longer value.*
❑ Step 3d	Set the Baud Rate.	*The SDS and the serial device(s) to which it is attached must use the same serial connection speed.*
❑ Step 3e	Set the Parity.	*Parity can be odd, even, or none.*
❑ Step 3f	Set the Data Bits.	*Data Bits can be 7 or 8.*
❑ Step 3g	Set the Stop Bits.	*Stop Bits can be 1 or 2.*
❑ Step 3h	Set the Flow Control.	*Flow control determines the handshake method used between the SDS and the serial device(s) to stop the serial input/output process.*
Steps 4a through 4d apply only to RS-232/422/485 (MEI) units		
❑ Step 4a (MEI only)	Configure the serial port interface. Click on the desired interface selector.	*This series of steps only applies to MEI units, such as the SSE-400.* *If you select RS232, the RS422/485 selections will be grayed out. Continue with* □ Step 5.
❑ Step 4b (MEI only)	Click on the desired duplex mode selector.	*Select* Full Duplex *to always enable transmit and receive drivers.* *Select* Half Rx *to only enable the transmit drivers when the SDS is transmitting; receivers always enabled.* *Select* Half Rx Tog *to disable receivers and enable the transmit drivers only when the SDS is transmitting.*

Step	Procedure	Description
❑ Step 4c (MEI only)	Click on the desired connector setup.	*Select* Loopback All *to internally loopback RTS and CTS in the SDS. AuxIn and AuxOut are looped at the connector. Select* Modem Control *to send RTS on the AuxOut signal and to receive CTS on the AuxIn signal.*
❑ Step 4d (MEI only)	Select 2- or 4-wire communication.	*Select* 2-wire *to use the transmit pair for both transmit and receive in RS-422/485. Select* 4-wire *to use a separate pair of wires for transmit and receive in RS-422/485.*
	Step 4 (non-MEI) / Step 5 (MEI) applies to all units	
❑ Step 4 (non-MEI) or ❑ Step 5 (MEI only)	Repeat the steps above for each port you need to configure and then press Save to implement all of your changes.	*Close and re-open the port to activate your changes.* *That's it! You're done. Your SDS is configured for the Raw TCP operating mode.*

Setting Auto TCP operating mode parameters

Note: Auto TCP is the only communication mode that lets an SDS initiate the connection.

Note: Auto TCP settings must include the baud rate, parity, data bits, stop bits, and flow control.

Note: In Normal and Raw TCP, an outside device such as a computer performs the act of connecting to the SDS. That's also one of the modes under Auto TCP. A PC can connect to the SDS and start transferring data back and forth using its serial port.

In Auto TCP, the SDS acts both as a client and as a server. As a client, it connects to the server at the specified TCP address and port. As a server, it will accept a Raw TCP mode connection.

You can configure an SDS port to use either DSR or Data to initiate a connection. As with Raw TCP, you must configure all the connection information (baud rate, data bits, and so forth) on the Serial Port Setup page. There is no way for the application to tell the SDS what to use for that serial port connection.

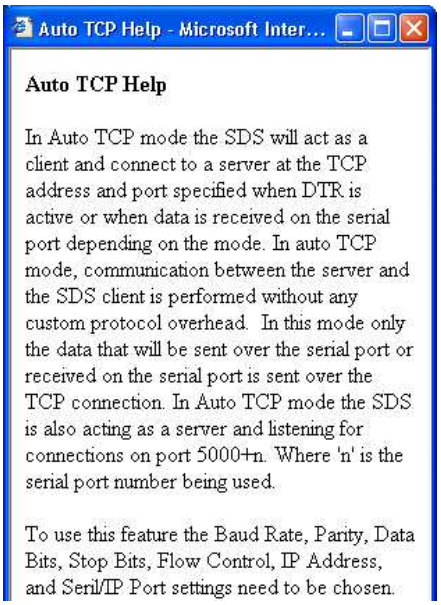
Auto TCP is also somewhat similar to Raw TCP in that only data passes through an SDS serial port – there are no headers and no packet. For this reason, you cannot use Auto TCP with our virtual COM port drivers.

You can connect to the SDS via another host and use a port just as you would in Raw TCP. The main differences between Raw and Auto TCP are that Auto TCP operates in two modes (DSR and Data) and that it can enable the SDS to initiate a connection.

- Auto TCP–**DSR** mode: When the SDS port sees DSR become active (raised), it connects, on its own, to the end point specified by the IP address and TCP port on the Serial Port Setup Web page. When DSR is de-activated, the SDS drops the network connection.
- Auto TCP– **Data** mode: When an SDS starts receiving data on its serial port, it connects to the end point specified by the IP address and TCP port on the Serial Port Setup Web page.

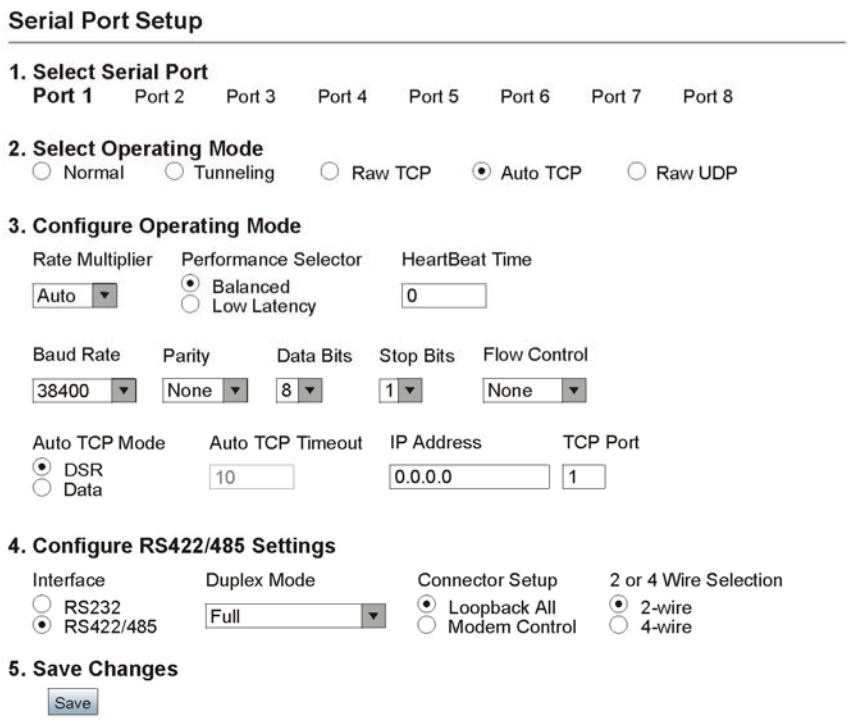
  Auto TCP timeout: When a given amount of time passes

without any new data, the SDS closes the connection. The Auto TCP Timeout is used only in Data mode, not in the DSR mode.

Step	Procedure	Description
❑ Preliminary Step	Click on Serial Ports in the selection bar. *Note: Setup screens vary slightly between RS-232 and RS-232/422/485 (MEI) units.* *If you have an RS-232/422/485 (MEI) SDS, the Configure Serial Port Interface step will display so that you can select between RS-232 and RS-422/485 operation.* *If you have an RS-232 SDS, the Configure Serial Port Interface step will not display and you will not be presented with any RS-422/485 configuration options.*	*The Serial Port Setup screen shown on the following page displays.* *Note: Click on a link to see a pop-up help screen for that item. For example, if you click on the Auto TCP mode link, the following help screen pops up.* 

Note: Click on a link to see a pop-up help screen for that item.

Figure 55 - Serial Port Setup screen for Auto TCP mode



Step	Procedure	Description
❑ Step 1	Select the serial port you want to configure.	*Click on a port number to select that port. The selections on the screen are automatically populated with any existing parameters for the selected port.*
❑ Step 2	Click on the Auto TCP Operating Mode selector.	*Auto TCP allows an SDS device to act as a client and to connect to the server when DSR is active or when data is received.* *You will find directions for configuring ports in Normal, Tunneling, and Raw TCP modes in the preceding sections. Directions for Raw UDP mode are in the following section.*
❑ Step 3a	Configure the Operating mode. Click on the desired data Rate Multiplier. Your choices are: ➢ *Auto (Recommended)* ➢ *Force X2 mode* ➢ *Force X4 mode* ➢ *Force X8 mode*	*The auto setting has no effect on the baud rate you set. However, if you select X2, X4, or X8, the baud rate of the serial port will be the baud rate that you set multiplied by 2, 4, or 8, respectively.* *Note: Forcing a change in the data rate may cause communication problems with some serial devices. If this is the case, change the setting back to Auto (Recommended).*
❑ Step 3b	Click on the desired Performance Selector.	*Choose balanced mode except in those cases where the serial device cannot tolerate the slight delays inherent in normal TCP/IP operation.* Balanced mode *offers excellent*

Step	Procedure	Description
		performance for most applications. Low Latency mode *heavily favors responsiveness over throughput.*
❑ Step 3c	Set the Heart Beat Time to a value from 1 to 65534 seconds. Default is 45 seconds. *Note: Use a value of 0 to disable the heartbeat timer.*	*Heartbeat messages help detect when a connection has been lost between the PC driver and the SDS.* *If you need quick notification that the connection has been lost, set this timer to a shorter value.* *If you are more concerned about network traffic, set this timer to a longer value.*
❑ Step 3d	Set the Baud Rate.	*The SDS and the serial device(s) to which it is attached must use the same serial connection speed.*
❑ Step 3e	Set the Parity.	*Parity can be odd, even, or none.*
❑ Step 3f	Set the Data Bits.	*Data Bits can be 7 or 8.*
❑ Step 3g	Set the Stop Bits.	*Stop Bits can be 1 or 2.*

Step	Procedure	Description
❑ Step 3h	Set the Flow Control.	*Flow control determines the handshake method used between the SDS and the serial device(s) to stop the serial input/output process*
❑ Step 3i	Click on the desired Auto TCP Mode selector. Your choices are: ➢ *DSR – Initiate the TCP connection when the SDS serial port's DSR becomes active* ➢ *Data – Initiate the TCP connection when the SDS serial port receives data*	*This selection determines whether the SDS port will initiate a communications link when DSR becomes active or when data is received at the serial port.* *Typically, the DTR output of the device to which you are connecting drives the DSR input on the SDS serial port.*
❑ Step 3j	Set the Auto TCP timeout interval if you selected Data as the Auto TCP Mode. *Note: This selection is only available if the Auto TCP Mode selector is set to Data. Otherwise, it is grayed out.*	*Sets the amount of time before the TCP connection is dropped after data stops.*
❑ Step 3k	Set the IP Address of the TCP host to which the SDS will connect.	*This selection sets the IP address to be used in Auto TCP mode.*
❑ Step 3l	Set the TCP Port number of the TCP host to which the SDS will connect.	*This selection sets the TCP port for Auto TCP modes.*
	Steps 4a through 4d apply only to RS-232/422/485 (MEI) units	
❑ Step 4a	Configure the serial port interface.	*This series of steps only applies to MEI*

Step	Procedure	Description
(MEI only)	Click on the desired interface selector.	*units, such as the SSE-400.* *If you select RS232, the RS422/485 selections will be grayed out. Continue with* □ Step 5.
❑ Step 4b (MEI only)	Click on the desired duplex mode selector.	*Select* Full Duplex *to always enable transmit and receive drivers.* *Select* Half Rx *to enable the transmit drivers only when the SDS is transmitting; receivers will always be enabled.* *Select* Half Rx Tog *to enable the transmit drivers and to disable receivers only when the SDS is transmitting.*
❑ Step 4c (MEI only)	Click on the desired connector setup.	*Select* Loopback All *to internally loopback RTS and CTS in the SDS. AuxIn and AuxOut are looped at the connector.* *Select* Modem Control *to send RTS on the AuxOut signal and to receive CTS on the AuxIn signal.*
❑ Step 4d (MEI only)	Select 2- or 4-wire communication.	*Select* 2-wire *to use the transmit pair for both transmit and receive in RS-422/485.* *Select* 4-wire *to use a separate pair of wires for transmit and receive in RS-422/485.*
	Step 4 (non-MEI) / Step 5 (MEI) applies to all units	
❑ Step 4 (non-MEI) or ❑ Step 5 (MEI only)	Repeat the steps above for each port you need to configure and then press Save to implement all of your changes.	*Close and re-open the port to activate your changes.* *That's it! You're done. Your SDS is configured for the Raw TCP operating mode.*

Setting Raw UDP operating mode parameters

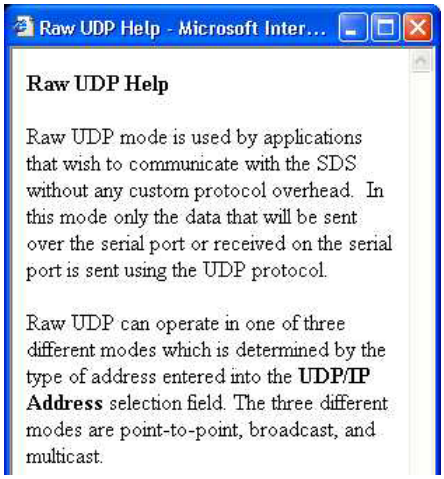
Note: In Raw UDP, your SDS can send messages to multiple receivers simultaneously.

Raw UDP is mainly used to broadcast messages over a network. It is a connectionless protocol that offers a direct way to send and receive datagrams over an IP network but provides very few error recovery services. UDP applications must generally be willing to accept some loss, errors, or duplication. Most UDP applications do not require reliability mechanisms and may even be hindered by them. If your application requires a high degree of reliability, you should use a protocol such as TCP.

UDP provides no guarantees for message delivery and a UDP sender has no way of telling the status of its messages once it sends them onto the network. For multicast packages, unlimited propagation of UDP packets through routers is prevented by the Time To Live (TTL) scheme. Each router decrements a packet's TTL value and only forwards those packets whose TTL value is greater than the threshold configured on the router.

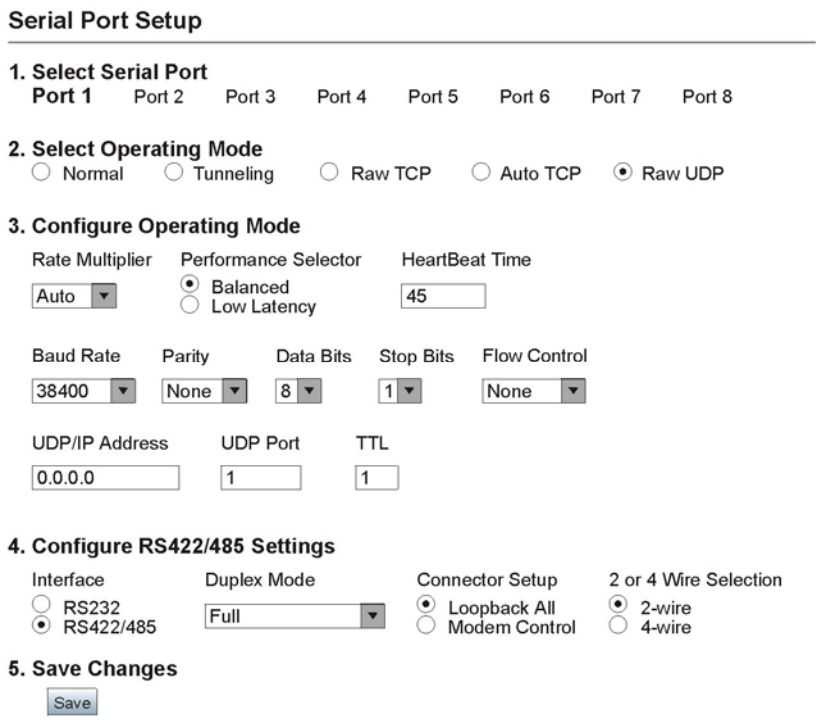
UDP has three possible modes of communication that you select according to the IP/UDP address you enter:

- Point to point – key in a specific device's address to communicate only with that device
- Broadcast – key in the broadcast address of 255.255.255.255 to send to all devices listening for the transmission
- Multicast – key in an address in the assigned UDP range of 224.0.0.0 – 239.255.255.255 to send to several devices with the selected address

Step	Procedure	Description
❑ Preliminary Step	Select Serial Ports from the selection bar. *Note: Setup screens vary slightly between RS-232 and RS-232/422/485 (MEI) units.* *If you have an RS-232/422/485 (MEI) SDS, the Configure Serial Port Interface step will display so that you can select between RS-232 and RS-422/485 operation.* *If you have an RS-232 SDS, the Configure Serial Port Interface step will not display and you will not be presented with any RS-422/485 configuration options.*	*The Serial Port Setup screen shown on the following page displays.* *Note: Click on a link to see a pop-up help screen for that item. For example, if you click on the Raw UDP link, the following help screen pops up.* 

Note: Click on a link to see a pop-up help screen for that item.

Figure 56 - Serial Port Setup screen for Raw UDP mode



Step	Procedure	Description
❑ Step 1	Select the serial port you want to configure.	*Click on a port number to select that port. The selections on the screen are automatically populated with any existing parameters for the selected port.*
❑ Step 2	Click on the Raw UDP Operating Mode selector.	*Raw UDP allows an SDS device to perform one to many transmissions.* *You will find directions for configuring ports in Normal, Tunneling, Raw TCP and Auto TCP modes mode in the previous sections.*
❑ Step 3a	Configure the Operating mode. Click on the desired data Rate Multiplier. Your choices are: ➢ *Auto (Recommended)* ➢ *Force X2 mode* ➢ *Force X4 mode* ➢ *Force X8 mode*	*The auto setting has no effect on the baud rate you set. However, if you select X2, X4, or X8, the baud rate of the serial port will be the baud rate that you set multiplied by 2, 4, or 8, respectively.* *Note: Forcing a change in the data rate may cause communication problems with some serial devices. If this is the case, change the setting back to Auto (Recommended).*
❑ Step 3b	Click on the desired Performance Selector.	*Choose balanced mode except in those cases where the serial device cannot tolerate the slight delays inherent in normal TCP/IP operation.* Balanced mode *offers excellent performance for most applications.* Low Latency mode *heavily favors*

Step	Procedure	Description
		responsiveness over throughput.
❑ Step 3c	Set the Heart Beat Time to a value from 1 to 65534 seconds. Default is 45 seconds. *Note: Use a value of 0 to disable the heartbeat timer.*	*Heartbeat messages help detect when a connection has been lost between the PC driver and the SDS.* *If you need quick notification that the connection has been lost, set this timer to a shorter value.* *If you are more concerned about network traffic, set this timer to a longer value.*
❑ Step 3d	Set the Baud Rate.	*The SDS and the serial device(s) to which it is attached must use the same serial connection speed.*
❑ Step 3e	Set the Parity.	*Parity can be odd, even, or none.*
❑ Step 3f	Set the Data Bits.	*Data Bits can be 7 or 8.*
❑ Step 3g	Set the Stop Bits.	*Stop Bits can be 1 or 2.*
❑ Step 3h	Set the Flow Control.	*Flow control determines the handshake method used between the SDS and the serial device(s) to stop the serial input/output process*
❑ Step 3i	Set the UDP/IP Address. These are your options: ➢ *Multicast* ➢ *Broadcast* ➢ *Point to point*	*This selection determines the destination IP address where data will be sent.* *For multicast, enter a valid multicast IP address (244.0.0.0 – 239.255.255.255) to broadcast data to a specific multicast group.* *For broadcast, enter 255.255.255.255 to broadcast the serial data to all devices ready to accept data.* *For point to point, enter a specific address to which the SDS can send UDP packets containing serial data.*
❑ Step 3j	Set the UDP port designation.	*Enter a valid UDP port number to which the SDS can send. The SDS will receive on both port 5000 and on the designated serial port number.*
❑ Step 3k	Set the TTL value.	*This selection sets the TTL (Time To Live) value for multicast packets. Each router decrements the TTL value of the packet and will only forward a packet if its value is greater than the threshold configured on the router. The following are standard settings:* ➢ *0 Restricted to host* ➢ *1 Restricted to subnet* ➢ *15 Restricted to site* ➢ *63 Restricted to region*

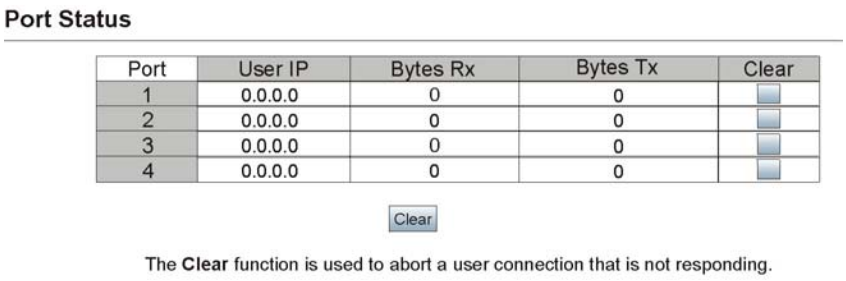
Step	Procedure	Description
		➢ *127 Worldwide* ➢ *255 Unrestricted*
Steps 4a through 4d apply only to RS-232/422/485 (MEI) units		
❑ Step 4a (MEI only)	Configure the serial port interface. Click on the desired interface selector.	*This series of steps only applies to MEI units, such as the SSE-400.* *If you select RS232, the RS422/485 selections will be grayed out. Continue with* □ Step 5.
❑ Step 4b (MEI only)	Click on the desired duplex mode selector.	*Select* Full Duplex *to always enable transmit and receive drivers.* *Select* Half Rx *to only enable the transmit drivers when the SDS is transmitting; receivers always enabled.* *Select* Half Rx Tog *to disable receivers and enable the transmit drivers only when the SDS is transmitting.*
❑ Step 4c (MEI only)	Click on the desired connector setup.	*Select* Loopback All *to internally loopback RTS and CTS in the SDS. AuxIn and AuxOut are looped at the connector.* *Select* Modem Control *to send RTS on the AuxOut signal and to receive CTS on the AuxIn signal.*
❑ Step 4d (MEI only)	Select 2- or 4-wire communication.	*Select* 2-wire *to use the transmit pair for both transmit and receive in RS-422/485.* *Select* 4-wire *to use a separate pair of wires for transmit and receive in RS-422/485.*
Step 4 (non-MEI) / Step 5 (MEI) applies to all units		
❑ Step 4 (non-MEI) or ❑ Step 5 (MEI only)	Repeat the steps above for each port you need to configure and then press Save to implement all of your changes.	*Close and re-open the port to activate your changes. That's it! You're done. Normal is the most common operating mode and the easiest to set up.*

Running diagnostic tests

Using the Port Status screen

Step	Procedure	Description
❑ Preliminary Step	Click on Diagnostics from the selection bar.	*The Port Status screen displays.*

Figure 57 - Port Status screen

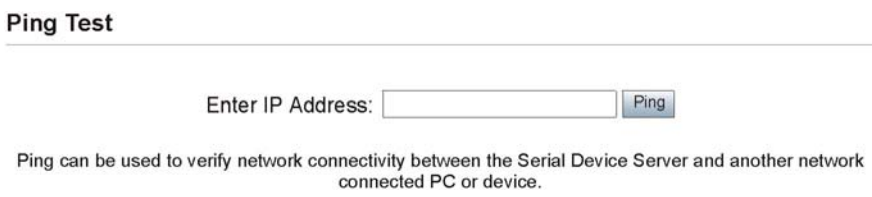


Step	Procedure	Description
❑ Step 1	Select the desired port.	*Click on the port number.*
❑ Step 2	Press the Clear key to reset the selected port.	*Pressing Clear lets you halt an unresponsive communications link.* *Use this procedure to free a com port that locks up. Note that the data trying to get through that port is lost and will need to be resent.*

Running the Ping test

Step	Procedure	Description
❑ Preliminary Step	Click on Diagnostics from the selection bar and then click on either of the Ping Test selections from the left panel.	*The Ping Test screen displays.*

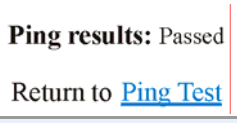
Figure 58 - Ping Test screen



Step	Procedure	Description
❑ Step 1	Enter the IP address of a device that is connected to the network.	*This can be a PC or other device.* *Use the Ping test to verify connectivity between the SDS and another device on the network as specified by the IP address field.*

Step	Procedure	Description
		Note: *This utility is not intended to ping the SDS from a PC, but for the SDS to ping a PC or other device. To ping the SDS from a PC on the network, use the ping command from a DOS command line.*
	Press Ping to run the test.	*The Ping results screen displays.*

Figure 59 - Ping results screen

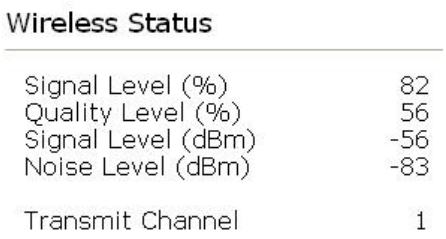


Step	Procedure	Description
❑ Step 2	Press the Ping Test link to return to the Ping Test screen.	*You can also press the Backspace key to return to the Ping Test screen.*

Checking wireless status

Step	Procedure	Description
❑ Preliminary Step	Click on Diagnostics from the selection bar and then click on Wireless Status from the left panel.	*The Wireless Status screen displays.*

Figure 60 – Wireless Status screen



Step	Procedure	Description
❑ Step 1	The wireless status displays the current channel number and a set of metrics that give an indication of the quality of the wireless connection	

Performing administrative functions

The Admin functions let you update the software, assign a descriptive name to the SDS, and manage users (control who can access the SDS from the Web interface). You can access these functions by selecting Admin from the selection bar.

Managing users

Note: You can create a maximum of ten users for each SDS.

Initially, the SDS is configured to have no exclusive users. This means that anyone with the device drivers installed and who knows the SDS' IP address can use the Web interface to configure and manage the SDS.

You can create users to restrict this type of access to approved personnel only. Once you create a user, only someone using that user ID and password has Web access to the SDS.

Showing users

Step	Procedure	Description
❑ Preliminary Step	Click on Admin in the selection bar and then select Show Users from the left panel.	*The Show Users screen displays. Passwords appear as asterisks.*

Figure 61 - Show Users screen

Step	Procedure	Description
❑ Step 1	Make note of any users you want to add or delete. Select Add/Del Users to add or remove users.	*Write down the user's name exactly as it appears including any spaces.*

Adding users

Step	Procedure	Description
❑ Preliminary Step	Click on Admin in the selection bar and then select Add/Del User from the left panel.	*The Add/Del Users screen displays.*

Figure 62 - Add/Del Users screen

Step	Procedure	Description
❑ Step 1	Enter the user name and password in the boxes provided.	*Passwords appear as asterisks.*
❑ Step 2	Select the Add option.	
❑ Step 3	Press the Submit key.	*A network confirmation prompt displays.*

Figure 63 - Network confirmation prompt

Step	Procedure	Description
❑ Step 4	Enter the user name and password in the boxes provided. If desired, check the Remember my password box.	*Be sure to key in the name and password in exactly as you did in the Add/Del Users screen. Both are case-sensitive.*
❑ Step 5	Click OK.	*You can now view the new user name and password by selecting Show Users from the Admin screen. Be sure to record the user name and password in a safe place.*

Deleting users

Step	Procedure	Description
❑ Preliminary Step	Click on Admin in the selection bar and then select Add/Del User from the left panel.	*The Add/Del Users screen displays.*

Figure 64 - Add/Del Users screen

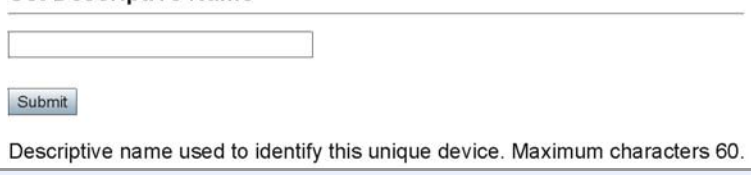
Step	Procedure	Description
❑ Step 1	Enter the user name and password in the boxes provided.	*Be sure to enter them exactly as they were originally keyed in when the user was added. Both the user ID and the password are case-sensitive.* *Passwords appear as asterisks.*
❑ Step 2	Select the Delete option.	
❑ Step 3	Press the Submit key.	*You can confirm the deletion of this user by selecting Show Users from the Admin screen. See below.*

Figure 65 - Show Users screen

Giving the SDS a descriptive name

Step	Procedure	Description
❑ Preliminary Step	Click on Admin in the selection bar.	*The Set Descriptive Name screen displays.*

Figure 66 - Set Descriptive Name screen



Step	Procedure	Description
❑ Step 1	Enter a unique name for this SDS that is descriptive of its function or location.	*Use a maximum of 60 valid characters (a-z, 0-9, and space).*
❑ Step 2	Press Submit.	*Your SDS' name now appears at the bottom of the Home page screen.* *Note: You can change or delete the name of your SDS by returning to the Set Descriptive Name screen and either changing or deleting the name and then pressing Submit.*

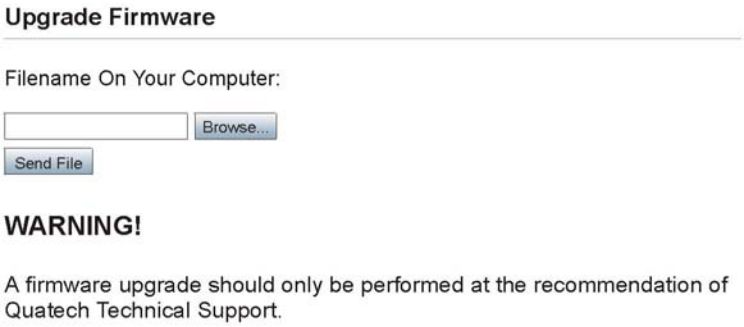
Upgrading firmware

Step	Procedure	Description
❑ Preliminary Step	Click on Admin in the selection bar and then select Upgrade Firmware from the left panel.	*The Upgrade Firmware screen displays.*

Note: Only SDS devices with a firmware revision level of 5.0 and above can support SNMP.

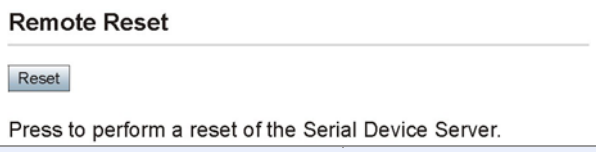
Determine the revision level of an SDS (check the bottom of the Home page in the Web-based interface) before upgrading the firmware.

Figure 67 - Firmware Upgrade screen



Step	Procedure	Description
❑ Step 1	Browse to the location with the revised firmware file.	*Most of Quatech's device drivers are available from our Web site.*
❑ Step 2	Press Send File.	*The Remote Reset screen displays.*

Figure 68 - Remote Reset

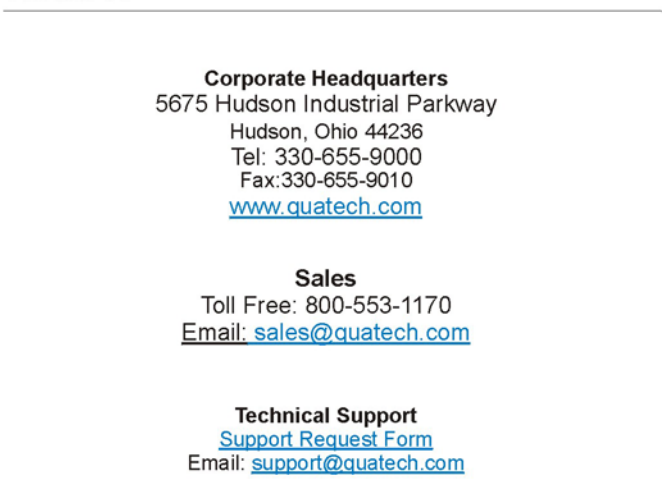


Step	Procedure	Description
❑ Step 3	Press Reset to reset your SDS.	*The SDS must be reset to implement the new firmware.*

Contacting Quatech

Step	Procedure	Description
❑ Step 1	From the Home screen, select Contact Us.	*The Contact Us screen displays.*

Figure 69 - Contact Us screen



Step	Procedure	Description
❑ Step 2	Click on either the sales or support Email links to contact the Sales or Technical Support departments, respectively.	*This screen provides Quatech's:* ➢ *Address* ➢ *Phone and fax numbers* ➢ *E-mail address for Sales* ➢ *E-mail address for Technical Support* ➢ *Web site address*

Troubleshooting and Maintaining an SDS

Troubleshooting an SDS

Note: Any unauthorized repairs or modifications will void the SDS' warranty.

This section lists some common problems and their causes. If the information below does not provide a solution, contact Quatech technical support.

Problem	Cause	Solution
The SDS does not turn on and no LEDs light up.	➢ The SDS or the power source is damaged, or the SDS does not have power.	1. Make sure that the power source is properly connected to the SDS' power jack. ***Caution! Only use the Quatech +5 V power source.*** 2. Make sure the power adapter is connected to a functioning electrical outlet. 3. Contact Quatech tech support.
The serial device will not respond even though the SDS is functioning.	➢ The serial device is not powered up; the serial cable is wrong/damaged, or the serial port settings are wrong.	1. Make sure the serial device is powered up. 2. Make sure the serial cable is properly connected to the serial device and to the SDS. 3. Verify the cable pinouts. 4. Try a different serial cable. 5. Try a different port on the SDS. 6. Review your serial device literature. Make sure the settings it specifies match those the SDS is using (check the SDS serial port settings using the Web interface). 7. Try plugging the serial device directly into a PC.
The search utility does not find the SDS.	Could be due to a variety of causes: ➢ Check power	Verify that the blue Power LED is lit. If the Power LED is not lit, 1. Check the power connection. 2. If power is connected properly, contact Quatech tech support.
	➢ Check status	Verify that the green Status LED is lit. If the Status LED is not lit, 1. Check the firmware version. a. If the SDS firmware has been upgraded from the factory default, reset the SDS to the factory default. See page 9. b. If the procedure to return to factory default fails, contact Quatech tech support. 2. Cycle power on the box and wait approximately 30 seconds. If the Status LED still does not light, contact Quatech tech support.

Problem	Cause	Solution
The search utility does not find the SDS, cont.	➢ Check LAN	Verify that the link status light under the LAN connection is lit. If it is not lit, 1. Check to see if the LAN patch cable is fully seated at both ends. 2. Make sure the hub is powered up and functioning. 3. Try another port on the hub. 4. Try another patch cable. 5. Contact Quatech tech support.
	➢ Check subnet	Verify that the SDS and the PC from which the search is being performed are on same subnet. *Note: There should be nothing other than a hub or a switch between the PC and SDS.* 1. Check with the network administrator to verify that the SDS and the PC are on same subnet. 2. If you are unsure of the subnet, check the IP address of the PC (by running ipconfig in a command box) against the IP address of another PC plugged into the same hub as SDS. 3. If the PC and SDS are on same subnet but a search still fails, connect the SDS directly to the PC using a crossover cable (if supplied; otherwise, use any Ethernet cable) and the instructions provided. 4. Contact Quatech tech support.
Web Browser does not display the SDS home page.	➢ Check Web connection	Use Ping to verify the connection. 1. If Ping *fails*: a. Find the SDS using the search utility. Display the network settings. 1. Is subnet mask OK? 2. Is Gateway address OK? 3. Is IP address OK? b. Can the PC ping another device on the same subnet as the SDS? 1. *No*: Correct the PC setup and then retry. 2. *Yes*: Contact Quatech tech support. 2. If Ping *passes*: a. Is Internet Explorer setup to use proxy server? If yes, disable the proxy server and retry. b. Is a supported browser being used? 1. *No*: Install and use supported browser. 2. *Yes*: Contact Quatech tech support.

Problem	Cause	Solution
Your application cannot open the COM port	➢ Wrong COM port number or other COM port-related problem; problem with application	1. Is the application set up to use the correct COM port number? a. *No* – Select correct COM port number. b. *Yes* – Continue with step 2. 2. Does COM port(s) show up in Device Manager? a. *No* – Go through the installation process, then verify that the COM port(s) shows up in Device Manager. b. *Yes* – In Device Manager, open the properties page under Multi-port Serial Adapters for the SDS and go to the SDS Configuration tab. 3. Does the auto query that runs when you select the SDS Configuration tab find the device? a. *Yes* – Continue with step 3: Try to open the COM port in HyperTerminal. b. *No* - Verify that the MAC address, IP address, Subnet mask, and gateway address are correct for the SDS being used. If not, click on the Advance button and use the search utility to select the correct SDS and set these parameters. Retry to see if the application will open the port. 4. Try to open the COM port in HyperTerminal. a. *Port opens*: There is a problem with your application that is beyond scope of this troubleshooting guide. b. *Port does not open*: You require help that is beyond the scope of this troubleshooting guide. Contact Quatech tech support.
Application can open COM port but data will not transfer.	➢ Check COM port in HyperTerminal	Using HyperTerminal, open the selected COM port. 1. Place a loopback connector on the selected COM port. 2. Set the communication parameters. 3. Type random characters. Does the screen show these characters echoed back? a. *Yes* - The port is functioning. b. *No* - Try another port. If the characters still are not echoed back, contact Quatech tech support.

Maintaining an SDS

Operating conditions

The SDS series is designed to work in environments that are free from dust, dirt, and moisture. You can operate an SDS at temperatures between 0° to 70°C. Do not leave an SDS where moisture can condense on it.

Handling the SDS

The following information can help you to use the SDS in a reliable, trouble-free manner.

- Make sure the SDS is off before you connect or remove the Ethernet cable.
- Make sure that all serial devices are connected correctly.
- Protect the SDS from excessively dirty or damp conditions.
- Do not drop, strike, or handle the SDS roughly. Handle it like any other piece of sensitive electronic equipment.

Moving the SDS

Follow these steps if you need to move your SDS or prepare it for shipment.

- Disconnect the power cable.
- Disconnect all other cables.
- If you are shipping the SDS, use the original packing material and container. If you no longer have the original packaging, use a sturdy carton and sufficient packing material to protect the SDS during shipment.

Cleaning the SDS

Clean the outside of the SDS as needed with a slightly moist soft cloth. Do not use solvents or abrasive cleaners.

Servicing the SDS

There are no user-serviceable parts in the SDS. Contact Quatech for repair. Be sure to obtain an RMA number from Quatech technical support before returning your SDS for service.
Support Request Form: http://www.quatech.com/support/support.php

Appendix A

Specifications

Size

Product	Size (L x W x H)
SSE/DSE-100/400	4.6" x 3.8" x 1.2" (11.8 x 9.5 x 2.9 cm) Mounting flanges add 1.0" (2.5 cm) to width.
QSE-100/400	10.0" x 5.3" x 1.3" (25.3 x 13.5 x 3.1 cm)
ESE-100/400	10.0" x 5.3" x 1.9" (25.3 x 13.5 x 4.8 cm)

LAN interface

10/100 Base T (IEEE 802.3), auto-negotiation and auto MDI/MDIX. RJ-45 Network connector

Optional 802.11b wireless networking

Serial interface

- Fully independent ports on multiport models
- DB-9 male, DTE configuration
- "M" models (e.g. QSE-100M) are supplied with 10-pin RJ-45 adapters that attach to the DB-9 connectors
- "W" models (e.g. DSEW-100) are equipped with 802.11b wireless networking capability
- Hardware flow control
- Full modem control

RS-232 (EIA-232) RS-232/422/RS-485

RS-232	# Serial ports	RS-232/422/485
SSE-100	1	SSE-400
DSE-100	2	DSE-400
QSE-100	4	QSE-400
ESE-100	8	ESE-400

Parity, Stop bits:

Parity configurable as:	None, Even, Odd
Data bits configurable as:	5, 6, 7, 8
Stop bits configurable as:	1, 1.5, 2

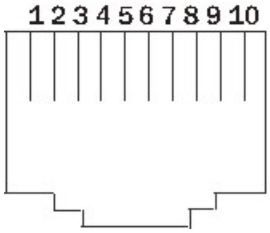
Speed:

Each serial port supports data transfer speeds of up to 921.6 kbps, depending on flow control protocols used, cable length and condition, and other factors. The aggregate throughput of all ports on any given Device Server is limited to approximately 5 Mbps.

Note: The surge suppression (–SS) option reduces effective baud rates to 115.2 Kbps maximum on each port. Please contact Technical Support at support@quatech.com for additional information.

Signals:

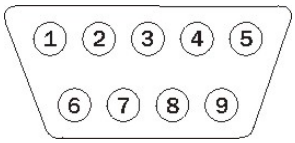
RJ-45:



View looking into the connector

RS-232 signal	Pin #	RS-422/485 signal, 4-wire mode	RS-422/485 signal, 2-wire mode
RI	1	TxD–	Transmit/Receive Data (Data–)
RTS	2	AuxOut+	N/C
DTR	3	AuxOut–	N/C
GND	4	GND	Signal Ground (GND)
TxD	5	TxD+	Transmit/Receive Data (Data+)
RxD	6	RxD+	N/C
DCD	7	AuxIn–	N/C
DSR	8	RxD–	N/C
CTS	9	AuxIn+	N/C
N/C	10	N/C	N/C

DB-9:



View looking into the connector

RS-232 signal	Pin #	RS-422/485 signal, 4-wire mode	RS-422/485 signal, 2-wire mode
DCD	1	AuxIn–	N/C
RxD	2	RxD+	N/C
TxD	3	TxD+	Transmit/Receive Data (Data+)
DTR	4	AuxOut–	N/C
GND	5	GND	Signal Ground (GND)
DSR	6	RxD–	N/C
RTS	7	AuxOut+	N/C
CTS	8	AuxIn+	N/C
RI	9	TxD–	Transmit/Receive Data (Data–)

Transmitter outputs

RS-232:

High Level Output:	+5 V (min), +5.4 V (typical)
Low Level Output:	–5 V (min), –5.4 V (typical)
Transmitter Skew:	50 ns (typical), 200 ns (max)

RS-422/485:

Transmitter Outputs:	2 V (min) for 100 Ohm load
Transmitter Skew:	5 ns (typical), 10 ns (max)
Distance:	4000 feet

Receiver inputs:

RS-232:

Input Voltage Rating:	–15 V to +15 V
Receiver Skew:	120 ns (typical), 250 ns (max)

RS-422/485:

Input Voltage Rating:	–15 V to +15 V Common Mode Input Voltage
Receiver Skew:	13 ns (typical)

Surge suppression option

Surge suppressor is applied to each line; capable of sustaining up to 40-A peak, 8 x 20-µs transient surges, a clamping voltage of 30 V (RS-232) or 15.5 V (RS-422/485), and a peak energy dissipation of 0.1 Joules.

Note: Units with the "SS" option are limited to 115.2 kbps due to capacitive loading.

Protocols and software

Quatech provides several ways to manage and configure SDS after installation:

a. Windows Device Manager (Quatech Device Manager on Windows NT4)

b. On-board utility accessible from a standard HTTP web browser.

c. Simple Network Management Protocol (SNMP)

d. IntelliSock TCP socket services

Management

UDP, TCP/IP, HTTP, DHCP, ARP, SNMP

IP configuration

DHCP, Static IP (set through SDS Installation Wizard) or custom UDP datagram utility

Communication modes

Normal, Tunneling, Raw TCP, Auto TCP, Raw UDP

Client OS support

Device drivers provided for Windows 2000, Windows XP, Windows NT4, and Linux
Other operating systems supported by IntelliSock TCP socket services
Check Website for latest OS support information

Hardware

Processor: Freescale / Motorola Power PC
SDRAM: 8 MB
FLASH Memory: 2 MB
FLASH is field upgradeable over Ethernet connection

Switches

All models:

On back panel:

- **Reset**: Resets the unit and does a hard reboot.
  User data in volatile memory cleared.
  System configuration unchanged.

  If held until Status LED flashes slowly and then released:
  User data in memory is cleared and *configuration* is reset to factory default settings
  If held until Status LED flashes quickly and then released:
  User data in memory is cleared and *system firmware* reverts to the factory default

Indicators

4- and 8-port models:

On front panel

- **Power**: On when unit has power

On rear panel

- **Link** (left side of Ethernet connector): Network connection
  ON = connected to network; OFF = not connected
- **Speed** (right side of Ethernet connector): Speed of network connection, ON = 100 Mbps; OFF = 10 Mbps.
- **Data**: Color RED if port is configured for RS-232 operation. Color GREEN if port is configured for RS-422/485 operation. Flashes when data is being sent or received on the serial port.
- **Status**: Off until box is running then turned on.
  If the Reset button is pushed in and held, the following occurs:
  1. Status LED flashes at a rate of 1 flash every 2 seconds for 10 seconds (slow flash).
     If Reset button is released during this time period, the *configuration* is reset to factory defaults; then the SDS automatically restarts.
  2. If Reset button is held past the first 10 seconds, the LED starts to flash at a rate of 1 flash per second for 10 seconds (fast flash).
     If Reset button is released during this time period, the SDS is reset back to factory default *firmware* revision; then the SDS automatically restarts.
  3. If Reset button is held past the first 20 seconds, the LED stops flashing.
     If Reset button is released during this time period, the SDS resets but the configuration is unchanged.

1- and 2-port models: All LEDs have the same definitions as above and are located as indicated below:

- **Power** – top cover
- **Link** – left side of Ethernet connector
- **Speed** – right side of Ethernet connector
- **Data** – next to DB-9 serial port(s)
- **Status** – next to power jack

Power supply DC input, with AC Adapters provided for 100VAC–240VAC, 50Hz–60Hz, Autosensing.
+5V, 2A (10W) max

Environment

Operating:	0° C to 70° C
Storage:	–40° C to 70° C
Relative Humidity:	10% to 90% non-condensing

Certifications FCC, CE, IC

Appendix B

Declaration of Conformity

Manufacturer's Name	Quatech Inc.
Manufacturer's Address:	5675 Hudson Industrial Parkway Hudson, Ohio 44236-5012 (USA)
Application of Council Directive:	Electromagnetic Compatibility (EMC) 89/336/EEC
Standards to which Conformity is Declared:	EN55022, 1988 EN55024, 1998
Type of Equipment:	Information Technology Equipment
Equipment Class:	Commercial, Residential, & Light Industrial Equipment
Product Names:	**SSE-/DSE-/QSE-/ESE-100D**: One-/two-/four-/eight-port RS-232 Serial Device Server with DB-9 connector(s) **SSE-/DSE-/QSE-/ESE-400D**: One-/two-/four-/eight-port RS-232/422/485 Serial Device Server with DB-9 connector(s) **SSEW-/DSEW-/QSEW-/ESEW-100D**: One-/two-/four-/eight-port RS-232 Serial Device Server with DB-9 connector(s) and Wi-Fi capabilities **SSEW-/DSEW-/QSEW-/ESEW-400D**: One-/two-/four-/eight-port RS-232/422/485 Serial Device Server with DB-9 connector(s)) and Wi-Fi capabilities **SSE-/DSE-/QSE-/ESE-100M**: One-/two-/four-/eight-port RS-232 Serial Device Server with RJ-45 adapters for DB-9 connector(s) **SSE-/DSE-/QSE-/ESE-400M**: One-/two-/four-/eight-port RS-232/422/485 Serial Device Server with RJ-45 adapters for DB-9 connector(s)
Model Numbers:	DB-9: SSE-100D, DSE-100D, QSE-100D, ESE-100D, SSE-400D, DSE-400D, QSE-400D, ESE-400D, SSEW-100D, DSEW-100D, QSEW-100D, ESEW-100D, SSEW-400D, DSEW-400D, QSEW-400D, ESEW-400D, RJ-45: SSE-100M, DSE-100M, QSE-100M ESE-100M SSE-400M, DSE-400M QSE-400M ESE-400M
Year of Manufacture:	2005

FCC Notice:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

The user is cautioned that changes and modifications made to the equipment without approval of the manufacturer could void the user's authority to operate this equipment.

It is suggested that the user use only shielded and grounded cables to ensure compliance with FCC Rules.

Caution: To comply with FCC RF exposure compliance requirements, a separation distance of at least 20 cm must be maintained between the antenna of this device and all persons.

Canadian Notice:

This device complies with Industry Canada ICES-003 regulations.
Cet appareil est conformé à la norme ICES-003 du Canada.
Operation is subject to the following two conditions:

1. This device may not cause interference, and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

To prevent radio interference to the licensed service, this device must be operated indoors only and should be kept away from windows to provide maximum shielding.

This device has been designed to operate with an antenna having a maximum gain of 2.2 dBi. Antennae having a higher gain are strictly prohibited per regulations of Industry Canada. The required antenna impedance is 50 ohms.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that required for successful communication.

The installer of this radio equipment must ensure that the antenna is located or pointed such that it does not emit RF field in excess of Health Canada limits for the general population.

Appendix C

Warranty information

Quatech, Inc. warrants the Serial Device Server to be free of defects in materials and workmanship for a period of five (5) years from the date of purchase. Quatech, Inc. will repair or replace any board that fails to perform under normal operating conditions and in accordance with the procedures outlined in this document during the warranty period.

Any damage caused by external causes, including problems with electrical power, servicing not authorized by Quatech, negligent installation or operation, failure to follow documented procedures, abuse, or general misuse of the product is not covered by the warranty. Custom configured products are non-refundable. Quatech makes no express warranties except those stated in this paragraph and in the applicable warranty statements for specific products in effect on the date of invoice. No representation is made regarding the suitability of this product for any particular purpose.

To request warranty service, you must call Quatech at (800) 553-1170, or submit the on-line form at: http://www.quatech.com/support/support.php within the warranty period with a description of the problem. If warranty service is required, Quatech will issue a Return Material Authorization (RMA) Number. You must ship the defective product back to Quatech during the warranty period in its original or equivalent packaging, prepay shipping charges, and insure the shipment or accept the risk of loss or damage during shipment. Quatech will ship the repaired or replacement products to you.

Quatech reserves the right to modify its warranty at any time, in its sole discretion. All software is provided subject to the license agreement that is part of the package. Customer agrees that it will be bound by the license agreement once the package is opened or its seal is broken. Quatech does not warrant any software under this Agreement. Warranties, if any, for software are contained in the license agreement that governs its purchase and use.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE. QUATECH'S SOLE OBLIGATION (AND CUSTOMER'S SOLE REMEDY) WITH RESPECT TO THE FOREGOING LIMITED WARRANTY SHALL BE TO, AT ITS OPTION, REFUND THE PURCHASE PRICE OR REPAIR/REPLACE ANY DEFECTIVE PRODUCTS, PROVIDED THAT QUATECH RECEIVES WRITTEN NOTICE OF SUCH DEFECTS DURING THE APPLICABLE WARRANTY PERIOD. CUSTOMER MAY NOT BRING AN ACTION TO ENFORCE ITS REMEDIES UNDER THE FOREGOING LIMITED WARRANTY MORE THAN ONE (1) YEAR AFTER THE ACCRUAL OF SUCH CAUSE OF ACTION. ALL EXPRESS AND IMPLIED WARRANTIES FOR THE PRODUCTS, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO THE WARRANTY PERIOD SET FORTH ABOVE AND NO WARRANTIES, WHETHER EXPRESS OR IMPLIED, WILL APPLY AFTER SUCH PERIOD. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

QUATECH, ITS LICENSORS, DISTRIBUTORS, AND SUPPLIERS (INCLUDING ITS AND THEIR DIRECTORS, OFFICERS, EMPLOYEES, AND AGENTS) SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION LOST PROFITS, BUSINESS INTERRUPTION, LOST OR CORRUPTED DATA OR SOFTWARE, OR ANY OTHER DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PRODUCTS, EVEN IF QUATECH OR ITS LICENSORS, DISTRIBUTORS, AND SUPPLIERS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. CUSTOMER AGREES THAT FOR ANY LIABILITY RELATED TO THE PURCHASE

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Please complete the following information and retain for your records:

DATE OF PURCHASE: _____

MODEL NUMBER: (see identification label on bottom of SDS for model number or Identifying Quatech's SDS product line for model descriptions)

☐ SSE-100D/M	☐ DSE-100D/M	☐ QSE-100D/M	☐ ESE-100D/M
☐ SSE-400D/M	☐ DSE-400D/M	☐ QSE-400D/M	☐ ESE-400D/M
☐ SSEW-100D	☐ DSEW-100D	☐ QSEW-100D	☐ ESEW-100D

PRODUCT DESCRIPTION: Serial Device Server

SERIAL NUMBER: _____

All products returned to Quatech for either warranty or non-warranty repair MUST be assigned a Returned Material Authorization (RMA) number prior to shipment. This RMA number must be clearly marked on the exterior of the product's return packaging and in any correspondence to ensure proper routing and prompt attention. To obtain an RMA number, contact Quatech Technical Support Department at 1-800-553-1170 or submit the on-line form at: http://www.quatech.com/support/support.php. In order to prevent damage to returned merchandise during shipment, please package electronic components in anti-static/shock proof materials.

For **warranty** repair/returns, please have the following information available when contacting the Technical Support department:

1. Model number and serial number of the product under warranty
2. Repair instructions and/or specific description of the problem

For **non-warranty** repairs or upgrades, contact the Technical Support department for current repair charges and please have the following information available:

1. Purchase order number to cover the cost of the service
2. Model number and serial number of the product
3. Repair or upgrade instructions relative to the product